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THE TREATMENT OF SPASMODIC TORTICOLLIS BY INTRADURAL POSTERIOR ROOT SECTION AND EXTRACRANIAL DIVISION OF THE SPINAL ACCESSORY.*

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The purpose of this paper is to report a case of spasmodic torticollis and to discuss briefly a type of surgical procedure employed to relieve the condition. The physiologic basis of the operation used in this case justifies the hope that it offers an additional means of overcoming a very stubborn disability.

D. J., aged 34, married, traveling salesman, was referred by Dr. Beverley R. Tucker, on January 17, 1926. In May, 1924, the patient had a high fever which lasted a day or two and toward the latter part of this attack he began to suffer with soreness and stiffness in the right side of the neck followed by jerking of the head and tonic spasm. The past history of the patient before the onset of torticollis showed that he had had repeated attacks of malaria; his tonsils had been removed twenty years before and a second tonsil operation done in 1921. In 1911, during a football game he received a fracture of the skull and probably a fracture of the outer edge of the left clavicle. There was no history or clinical evidence of syphilis or previous nervous disease. A submucous resection of the nasal septum with subsequent operation upon the turbinates and removal of nasal polyps had been done in 1924 to relieve a chronic nasal obstruction. There had been impaired hearing on the right side for a number of years, attributed to a chronic infection of the middle ear. His treatment for torticollis prior to operation in 1926 consisted of attempts to eradicate focal infection, intelligent physiotherapy, electricity and mechanical bracing of the head by means of a plaster cast. It was found to be impossible, however, to apply a cast of sufficient strength to prevent the contraction of the neck. Marked variation was reported in the severity of the attacks prior to operation. Sometimes improvement followed massage and again the patient felt better after operation upon the nose. There was never a complete disappearance of the spasm, but whenever the powerful tonic spasms which drew the occiput downward and to the right were lessened in severity, the patient felt greatly relieved.

Examination of the patient at time of his admission to the hospital in 1926 showed a powerful, athletic man 6 feet 3½ inches in height and weighing 260 pounds. The circumference of the neck had increased one inch since the onset of his trouble and at the time of his operation it was 18½ inches. The general examination, apart from the head and neck, was of no particular interest. The contraction of the neck muscles was typical of torticollis, which is well illustrated in the photographs Nos. 1 and 2. The patient frequently used his hands to flex the head when the tonic spasm of the posterior cervical muscles would retract the occiput. The chin was drawn upward and deviated to the left. The right ear was brought almost in contact with the right shoulder. The spasms were not confined to the right posterior muscles but at times the occiput would go almost directly backward. The usual position of the head, however, was with the occiput retracted and to the right with the chin well up and to the left. At times there would be clonic twitching of the chin but there was no overflow from the neck region except to the frontalis muscles, causing some corrugation of the brow during the most marked tonic spasm. The patient was becoming almost completely disabled and for eighteen months before admission to the hospital his time had been given almost entirely to one form of treatment or another. He had had a marked change of voice for many years. The voice was thick and tremulous and enunciation appeared to be difficult. Examination of the vocal cords, however, showed normal motor function. There was a slight, inconstant nystagmus both to the left and right. The cranial nerves were normal with the exception of the eighth and the right spinal accessory. The spasms of the neck, as is usually the case, were greatly intensified by

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walking or any motor activity. X-ray examination of the head and cervical spine was negative.

This patient was shown at a meeting of the Society of Neurological Surgeons in 1924 and there was general agreement by those present that the case was one of intractable spasmodic torticollis, requiring a radical type of operation. Attention was called to a similar case reported in *Surgery, Gynecology and Obstetrics* by McKenzie from Dr. Cushing's clinic in 1924. In this case Dr. Cushing had divided the anterior and posterior roots of the 1st, 2nd and 3rd cervical nerves on the right, combined with an intracranial section of the right spinal accessory. The success of the operation was reported by McKenzie as beyond expectations. In discussing the condition McKenzie suggested the possibility of relief of spasmodic torticollis by a bilateral section of a number of posterior cervical nerve roots together with a section of the accessory. Because of the bilateral involvement in our case it appeared unlikely that any operation dealing with one side alone would be satisfactory. The possibility of breaking the spasm by destruction of the afferent nerves from the involved muscles had been amply demonstrated by the work of Sherrington in studies of decerebrate animals. It was decided to adopt McKenzie's suggestion in the case reported and to divide four upper posterior roots after an exploration of the right cerebello-pontile angle. A slight nystagmus and impaired hearing on the right side made it advisable to consider the possibility of a lesion in the right cerebello-pontile angle. Because of the temporary paralysis of the right vocal cord in the case reported by McKenzie, following intracranial section of the spinal accessory, preference was given to a section of this nerve in the neck.

Operation:—On January 25, 1926, with the patient placed on a cerebellar frame, a midline incision was made from just above the external occipital protuberance down to the 6th cervical spine. A short horizontal incision above the superior curved line crossed the median incision very much as short arms of a cross-bow incision is used for a cerebellar operation. By keeping in the midline, hemorrhage was not troublesome but the considerable depth of the wound slowed up the operative manipulations considerably. The laminae of the 1st, 2nd and 3rd vertebrae were removed and the posterior rim of the foramen magnum, along with an area of bone about 2 inches in diameter, mostly to the right side, was ronguered away. The dura was opened and a superficial examination made of the right cerebello-pontile angle. Nothing abnormal was discovered. The posterior roots of the 1st, 2nd, 3rd and 4th nerves were divided on each side—Figure No. 1. The identification of the 1st right posterior root was not accurate, but inasmuch as there is considerable variation of this nerve and its afferent function is evidently low, it was not of

No. 1. Photograph of patient in one of the severe spasms of the neck muscles before operation. The occiput was brought almost in contact with the shoulder which was elevated in the spasm.

No. 2. Posterior view of the patient showing marked rotation of the chin to the left but without retraction of the occiput.

great importance to divide it. Because of the muscular development of the patient the difficulties of operation were such as would attend any of the radical operations for this disease. The 2nd cervical nerve root required ligation

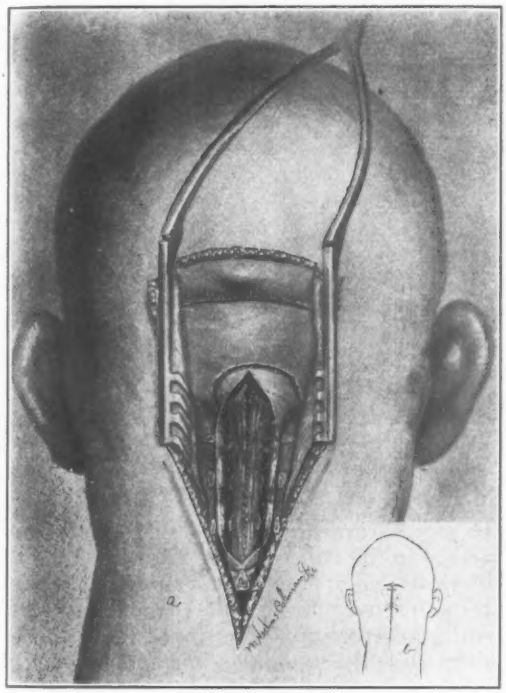

Fig. 1. a.—Exposure of upper cervical cord and medulla. The posterior roots have been divided just proximal to their entrance into the dura. The drawing gives no idea of the depth of the wound in a patient of a large size and great muscular development. The spinal filaments of the accessory nerve are seen passing upward anterior to the sensory roots. The dura was carefully closed after section of the roots.
b.—Shows the skin incision.

before division, because of a vessel of considerable size which accompanied the nerve root. The spinal filaments of the accessory nerve were brought into view and a section made of some of the lower ones. The dura was carefully closed and a closure of the muscles and skin made in layers. The patient stood the operation well and his convalescence was without incident. Upon his recovery from the anesthesia he experienced great relief of the spasm which before the operation had become troublesome even when lying in bed. Spasm of the posterior muscles did not return after the operation but there was some deviation of the chin to the left. During the following two weeks and before the spinal accessory was divided, it was possible to make careful observation as to the effects of posterior root division alone. The right accessory nerve was then resected

No. 3. Midline incision is shown. A transverse incision about 2 inches in length was made above the deep wrinkle which is plainly shown.

under local anesthesia by my associate, Dr. J. G. Lyerly, just proximal to its entrance into the sternomastoid muscle. The patient was discharged from the hospital one month after his admission. A number of examinations have been made of the patient since this time, the most recent of which was on October 4, 1926, about nine months after operation.—Photographs Nos. 3 to 7. The patient considers himself practically well. At times in talking and sometimes in driving, there is a slight tendency

No. 4. Photograph of patient six weeks after operation. Note the position of the chin in the midline.

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for the occiput to pull to the right. This causes little inconvenience and may be promptly corrected. He has some difficulty in raising the right arm to his head. The patient states that while he felt there was great improvement immediately after the operation, the maximum benefit had not been attained until about nine months after the operation. The anesthesia resulting from division of the posterior cervical roots was not troublesome. Figure No. 2. The spinal accessory nerve was atrophied and the lower belly of the omohyoid stands out prominently. He is able to carry his chin with ease and comfort either to the left or right. There has been no improvement in the voice. Microscopic examination of the resected portion showed nothing of particular significance.

In resection of the upper four posterior roots to abolish spasm of the cervical muscles it is at once obvious that a number of muscles involved in the spasm are supplied by all of the cervical nerves. Only the spinal accessory, trapezius and upper rotators would have their entire afferent supply destroyed by the operation, while the splenius, semispinalis and some of the long extensors would not be affected in their lower cervical segments. It would be feasible as suggested by McKenzie to include the 5th and 6th posterior roots in the section. If carried lower there would be some anesthesia of the hand. Posterior root section may be combined with section of the 1st and 2nd anterior cervical roots depending upon the amount of spasm. Involvement of the muscle groups indicates some impairment of higher control, but it is difficult to accept Oppenheim's theory that the lesion is in the cerebral centers representing the movements of the neck. The tonic spasms of torticollis resemble an exaggerated fixation of the muscles which normally maintain the head in the erect posture. Attention has been called to labyrinthine disturbance as a possible cause of this disease. In the case reported the patient had some nystagmus and impaired hearing on the right. There has been an accumulation of data to indicate that the condition may be a postural defect of the antigravity muscles. Unilateral section

No. 5. Head in position as before operation but with no spasm.
No. 6. Patient with head to the right. This was almost impossible before the operation.

No. 7. Patient standing. Note the atrophy of muscles of right side of neck. The neck spasm before operation was usually intensified upon standing or walking.

of the posterior nerves for spasmodic torticollis was reported by Dr. Alfred S. Taylor in Johnson's Operative Therapeusis. In a similar operation he divided the spinal portion of the accessory nerve. He regarded the result as partly satisfactory at the end of three years.

The operation of high cervical laminectomy directly impairs, at least temporarily, the function of some of the muscles concerned in the spasm, notably the splenius, inferior oblique and portions of the complexus. This direct interference with the muscles themselves may be a factor in the results. In a most important recent contribution in the Annals of Surgery, 1925, Dr. Finney carefully reviews the literature and summarizes briefly all that is known of the etiology and diagnosis of this condition. As a result of his observations he advocates a well planned procedure, having for its object the extraspinal section of the anterior and posterior roots of the upper three cervical nerves and division of some of the muscles concerned in the spasm. The results in his hands, particularly after perfecting the technic of operation, have been highly satisfactory. In reporting the end-results of a rather large series of cases, 32 in all, Dr. Finney noted that the maximum improvement was not reached in a number of patients for some months after operation. As to the difficulty and risk of intrameningeal root section compared to the Finney operation, there is probably very little difference. In a thick-necked person—and these patients often have hypertrophy of the muscles—the procedure is decidedly of a major type if an adequate operation is done. In less muscular individuals we have divided the cervical roots under local anesthesia. So far as we know there is no disability of the cervical spine following laminectomy, and no form of rigid fixation is necessary after the operation. The case reported is an interesting physiological experiment which has been attended by highly satisfactory clinical results, but the well known tendency of the disease to recur or spread after all forms of operation, leads to caution in making claims for the superiority of any surgical procedure.

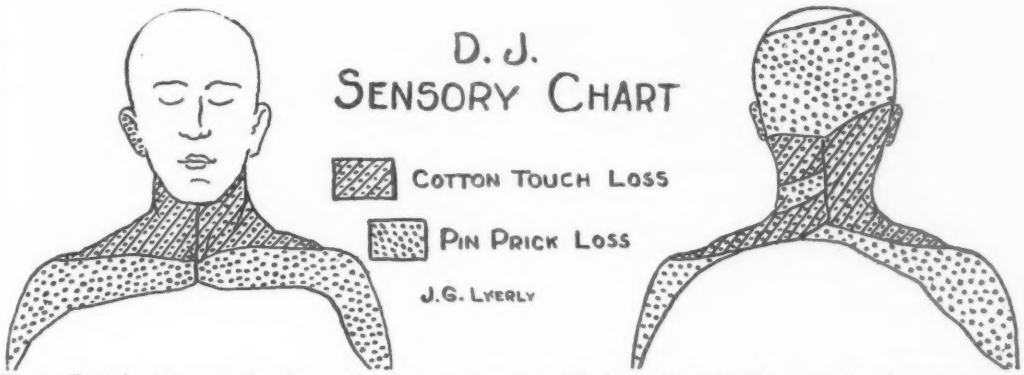

Fig. 2.—Chart showing sensory loss five months after operation. It is difficult to account for the preservation of tactile sensation in the small area on the left posterior surface of the neck as indicated in the chart.

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Professional Building.

A REVIEW OF VARIOUS METHODS PROPOSED FOR THE TREATMENT OF MERCURIC CHLORIDE POISONING.*

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In the treatment of poisoning following the oral administration of mercuric chloride, efforts are usually directed toward detoxicating the mercury remaining in the alimentary tract and also that which has gained entrance into

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the circulation. In the present discussion, however, the various therapeutic procedures which have been suggested in this form of poisoning will be placed in one of the two groups, created by the supposed efficacy of the measure against the poison either *before* or *after* absorption.

When a patient is seen soon after the ingestion of a toxic dose of mercuric chloride, the value of gastric lavage is too generally acknowledged to necessitate any extended discussion. The question arises, however, whether it is possible to increase the effectiveness of lavage by the use of a chemical antidote; or, because of the existence of some contraindication to lavage, whether any of the proposed antidotes is of value in the absence of this procedure?

It is difficult or impossible to obtain positive information as to the value of an antidote for mercuric chloride by clinical observation. In the first place, it is not known what amount of mercuric chloride will invariably prove fatal when given orally to an adult human being. The presence of food in the stomach, unusual delay in the discharge of the gastric contents into the intestine, heightened susceptibility to the irritant action of the drug in the stomach, leading to prompt emesis, that indefinite condition designated high individual resistance,—the presence of one or more of these factors may bring about the recovery of a given patient after a dose of the poison which would rapidly result in the death of others. It has been assumed that a single bichloride of mercury tablet of 7.3 grains will invariably lead to the death of man in the absence of treatment, but a case has recently come under my observation where many times this amount was taken and recovery occurred, although more than 24 hours elapsed before the institution of any therapeutic measures.

In the second place, the clinician never has such implicit confidence in the antidote that he employs it to the exclusion of all other treatment. In addition to the fact that the patient may have a high resistance from the presence of the factors previously mentioned, it is seldom that gastric lavage is not employed, generally along with other measures of less clearly demonstrated worth. If, now, an antidote is included among the latter and the patient survives, are we justified in attributing this happy outcome solely to the antidote?

In animal experiments, the stomach may be emptied by preliminary starvation; emesis may be prevented by the administration of morphine; and, finally, the antidote is used alone, thus eliminating the disturbing influence of other therapeutic procedures. Because of these considerations, in the present discussion, the value of any of the proposed antidotes will be inferred from the results of animal experiments rather than from the reports of clinical trial.

Of the various antidotes that have been proposed for neutralizing mercuric chloride in the stomach or intestines, some form of albumin is the most popular. Experiments on rabbits that have been carried out by Fantus have shown, however, that milk, eggs, or serum albumin are practically valueless, even when mixed with the poison, prior to administration. Hesse has recently furnished additional evidence that albumin is incapable of influencing the course of the poisoning by mercuric chloride. The explanations offered for this failure of the antidote are either that solution of the so-called albuminate of mercury occurs readily in an excess of albumin or in an excess of certain neutral salts.

Hall suggested the use of a solution of quinine hydrochloride, hydrochloric acid, and potassium iodide, because of his observation that this mixture was capable of precipitating mercuric chloride. Fantus and Barbour have proved, however, that Hall's antidote is of no avail, either when mixed with the poison before oral administration or when injected into the circulation.

A mixture of six parts of sodium phosphite and four parts of potassium acetate was proposed as an antidote by Carter, the supposed reason for its efficacy being ascribed to the fact that the phosphite reduces mercuric chloride to calomel and the potassium acetate acts as a diuretic. From experiments carried out on rabbits, Fantus concludes that Carter's antidote is valuable; but the conditions existing in these experiments were absolutely unlike those encountered clinically. The solution of mercuric chloride was introduced into the stomach of the rabbits through a tube, to be followed immediately by the antidote. Later, in association with Hyatt, Fantus carried out further experiments. In these, five minutes

were allowed to elapse between the administration of the poison and that of the antidote—a lapse of time entirely too short to allow any significance to be attached to the results. It is conceivable that Carter's antidote may be of value in poisoning by the oral administration of mercuric chloride, but that such is actually true under the conditions that will be encountered clinically has never been proved.

Fantus himself suggested the use of a mixture of sodium hypophosphite and hydrogen peroxide, concluding that this was second only to Carter's antidote in efficacy. However, the same criticism applied here as in the case of his experiments with Carter's antidote; the lapse of time between administration of poison and antidote was entirely too short.

Theoretically, effective detoxication of the mercury could be accomplished by its transformation into a sulphide. Sabbatini attempted to bring this about by the use of hydrogen sulphide, but his results were disappointing. Later, Peyron, and also Kunkel, experimented with sulphides as antidotes to mercuric chloride, but met with no success. More recently, Hayward and Allen proposed the use of calcium sulphide, and, in 1917, Wilms published a paper, lauding the effects of this substance in detoxicating mercuric chloride. Actual experimentation has shown, however, that calcium sulphide must be administered within five minutes of the poison in order to exert any influence; and the claim has been made that if the lapse of time is greater than this, the supposed antidote is, in reality, definitely harmful.

Among the most recent additions to the list of antidotes for mercury is sodium thiosulphate. Ravaut appears to have been the first to suggest the use of this antidote, but attention has been directed to it in this country especially by the papers of McBride and Dennie. According to McBride and Dennie, sodium thiosulphate constitutes a valuable antidote for mercury and other metals, whether these are in the gastro-intestinal tract or have been absorbed into the blood stream.

Theoretically, sodium thiosulphate should be less efficacious even than calcium sulphide when administered with the object of precipitating the mercury in the stomach or intestines, since thiosulphate ionizes less rapidly than does calcium sulphide. Experiments carried out in our laboratory on dogs seem to indicate quite clearly that if as much as fifteen minutes intervene between the administration of the mercuric chloride solution orally and the administration of the sodium thiosulphate, absolutely no antidotal effect is observed, the proportion of animals dying after thiosulphate medication being as high as in the untreated controls.

Actuated by the belief that the local action of the mercury in the gastro-intestinal tract is largely or entirely responsible for the toxic manifestations and the fatal outcome, Ziegler suggests the administration of mucilage of acacia in the treatment of mercuric chloride poisoning. From similar reasoning, Landau, Marjanko, and Ferkin recommend a mixture of bismuth subnitrate and bismuth subcarbonate. In dogs, however, neither mucilage of acacia nor enormous doses of bismuth subcarbonate have prevented death, although given within a few minutes after barely the M.L.D. of mercuric chloride.

Within the past year, Hesse reported the results of experiments on mercury antidotes. He met with no success with any, save sodium hyposulphite. This substance, he says, should be distinguished from sodium thiosulphate, the formula for the hyposulphite being $Na_2S_2O_4$; while that of thiosulphate is $Na_2S_2O_3$. One gets the impression that Hesse's work was carefully carried out and adequately controlled; he states, however, that dogs given hyposulphite after mercuric chloride invariably vomit; consequently, he drew his conclusions as to the efficacy of the antidote from tests carried out on rabbits. For various reasons, rabbits are less satisfactory than dogs, and it is not desirable that attempts should be made to confirm Hesse's observations on these latter animals. So far, it has been impossible for us to secure a supply of the hyposulphite for this purpose.

As is well known, salts of magnesium are poorly absorbed from the lumen of the intestine. Sulphates of various cations, likewise, are poorly absorbed. It is to be expected that a combination of the poorly absorbable magnesium with the sulphate radicle would possess this property of unabsorbability to a high degree—a supposition that is confirmed by actual trial,—and upon its unabsorbability depends the cathartic action of magnesium sulphate. The salt does not diffuse through the walls of the intestine to any appreciable extent, giving

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rise to an increased osmotic tension and attracting water into the lumen of the gut. Having such an action, it might be possible that the flow of water from the tissues into the intestine might interfere with the absorption of other substances than the magnesium sulphate. Early experiments carried out in our laboratory appeared to indicate that the administration of large amounts of a 25 per cent solution of magnesium sulphate as long as 30 minutes after a fatal dose of mercuric chloride was of definite benefit; further investigation, however, has failed to confirm this.

Turning next to the possibility of combating the poison after it has passed into the blood stream: In 1917, Sansum showed that after a barely fatal dose of mercuric chloride was injected intravenously, most copious diuresis, induced by the intravascular injection of hypertonic dextrose solution, dextrose in Ringer's solution, or of Fischer's solution, failed to avert a fatal outcome, although the treatment was instituted promptly after the injection of the poison.

MacNider has observed that the intravenous injection of a hypertonic solution of sodium carbonate or bicarbonate appears to protect the kidney against the toxic action of mercury or uranium. Many clinicians have been so impressed by this report that the alkali treatment of mercury poisoning has gained quite a vogue. In our laboratory, however, it has been shown that the intravenous injection of 5 per cent bicarbonate of soda solution has not the least influence on the course of the poisoning following the intravenous injection of a large dose of mercuric chloride, as judged by the steady rise in the rest nitrogen of the blood and the eventual demise of the dog. Moreover, in numerous reports, attention has been directed to the fact that the careless injection of hypertonic soda solutions intravenously is a procedure accompanied by much danger to the patient.

As was mentioned previously, both calcium sulphide and sodium thiosulphate have been recommended for the purpose of detoxicating the mercury that has been absorbed. The intravenous injection of calcium sulphide is not only lacking in efficacy but is so dangerous that it should never be resorted to. Sodium thiosulphate, on the other hand, is well tolerated when injected in doses as large as a gram per kilogram body weight. Unfortunately, sodium thiosulphate is entirely lacking in any ability to neutralize the mercury that has been absorbed, even though the supposed antidote is injected as early as five minutes after the entrance of the poison into the circulation.

In 1917, Burmeister, impressed by the fact that mercury could be demonstrated in the blood for a considerable time after its administration, attempted to save animals poisoned by large doses of mercury through extensive bleeding and subsequent injection of washed red corpuscles. Although all of his treated animals succumbed, he believed that the intensity of the renal damage was lessened by this procedure. The paper of Robertson, in which excellent results were reported following the employment of a method designated "exsanguination-transfusion" in the treatment of various forms of intoxication, encouraged us to apply this method in the attempt to save dogs after a fatal intravenous dose of mercuric chloride. Within a few minutes after the injection of the mercuric chloride solution, the animals were bled from the femoral artery, small amounts of blood being withdrawn at a time and slightly larger quantities of matched blood from another dog being injected into the femoral vein. This was continued until an amount of blood estimated as equal to the animal's total blood volume was removed and a slightly larger amount of blood from the donor introduced into the vein. Without exception, the procedure resulted in an earlier death on the part of the treated animals.

It must be confessed that the spirit of optimism does not permeate this review. The various procedures that have been proposed for the therapy of mercuric chloride poisoning, when subjected to critical test, are, with scarcely an exception, found wanting. One conclusion of a constructive nature may be drawn from the facts that have been presented; the safest way to prevent death from mercuric chloride poisoning is to prevent absorption; and when the poison has been administered orally, this may be best accomplished by prompt and thorough gastric lavage. In the present state of our knowledge, antidotes for mercuric chloride must be looked upon as better fitted for affording mental solace to physician and patients rather than as being capable of accomplishing a detoxication of the poison.

DISCUSSION.

DR. J. MORRISON HUTCHESON, *Richmond*:—In beginning this discussion, I wish to express my firm belief in the value of this kind of paper. In medicine

we are prone to arrive at hasty conclusions based on recent favorable experiences and to share in the enthusiasm of others who themselves have drawn broad deductions from rather shaky premises. This tendency is probably largely responsible for the rapidly changing "latest treatments" that we have for so many of our diseases, and unless we stop now and then and think out things and get our bearings it is hard to tell whether we are going forward or back.

My experience with mercury poisoning has been largely in the hospital division of the Medical College of Virginia, where in the last ten years there have been twenty-nine cases treated. In the past two years there have been seven cases, with two deaths apparently from uremia. A review of these seven cases, which I have recently made, gives practically nothing from which one might draw a conclusion as to the value of treatment. It is true that our observations have been, in the main, extremely superficial. The highest amount of bichlorid taken was 22½ grains, but this patient vomited soon afterward and later recovered. Gastric lavage was done in all cases with variable frequency, and kept up for a variable length of time, usually until the patient appeared to be out of danger. A variety of other treatments were tried—in most instances abundant fluid, mouth wash, heat, and Epsom salts. One fatal case was treated with sodium thiosulphate, another by exsanguination transfusion. The two fatal cases came to the hospital several days after the poison was taken, but in most instances the treatment was begun within a few hours. I believe in prompt, frequent and long continued gastric lavage. Gatewood and Byfield, of the Cook County Hospital, reported finding the poison in the gastric washings up to the eleventh day. The lavage should be kept up until the mercury has disappeared.

HEART SOUNDS AND THEIR INTERPRETATION.*

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A little over a hundred years ago the distinguished Frenchman, Laennec, reported that he was using a new instrument, a stethoscope, and described with brilliant accuracy the sounds that he heard when he studied the movements of the heart in health and disease. Since the time of Laennec numerous books and articles have been written which were devoted more or less entirely to a discussion of the heart sounds. These discussions have been very elaborate and complete, so much so that the author of this paper wishes to disclaim in the beginning any attempt at adding to them in any way. My excuse for writing this paper lies in the feeling that our understanding of the meaning of things already written is a personal matter, and that when we attempt to interpret our stethoscopic findings in the light of the writings of others we immediately open up a field wherein opinions vary widely.

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Another excuse for presenting this paper is the fact that the death rate from heart disease is steadily increasing. Judging from the investigations of the Metropolitan Life Insurance Co. in its 15,000,000 industrial policyholders, there are constantly well in advance of 2,000,000 men, women and children with organic heart disease in this country. Of these 2,000,000, two hundred thousand die of their heart disease annually, which gives us as a fairly accurate estimate the rather startling statement that the average life of an individual with organic heart disease is ten years.

An ideal state of affairs would be for every one of us who listens to any one heart to hear exactly the same sounds and to read into these sounds exactly the same meaning. As long as we are human beings, this will, of course, be quite impossible, but the oftener and the more conscientiously we attempt to establish uniform methods of examination, and uniform standards of interpretation, the closer we can come to forming a unanimous opinion as a necessary corollary to our examinations.

The media through which these sounds must pass, particularly endocardial sounds, namely, the heart muscle, the pericardium, the lung and its membranes, the muscles and fatty tissues of varying thickness, the bell, rubber tubing and ear pieces of the stethoscope, and, finally, the difference in the acuteness of the sense of hearing of different individuals, must inevitably lead to some variation in what is actually heard even when we do our best. Still, the expression "when doctors differ," used in a sort of jeering fashion, reflects discredit on us that we deserve more frequently than we should. We should more often collect the same facts, and the collected facts should more often make difference impossible.

It must not be understood that I am laying too much stress on the value of the heart sounds in our final summary of all the findings, nor that I even mean to say that any sound heard during the cardiac cycle can always be used to make a complete diagnosis of cardiac pathology. On the contrary, it should be stated very positively that, though heart sounds alone may generally be used to inform us as to the presence of heart disease, they are practically never alone and by themselves an accurate measure of what the disease really means.

It seems to me the mistake that is most commonly made in examining the heart is that

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enough time is not allowed. We should be more deliberate, and should study attentively what we hear. We should consciously break sound up into its attributes, pitch, duration, quality and intensity, and study each attribute separately. It should not be necessary to say that the heart must never be examined at all until all clothing has been removed, and I would not mention this if I had not recently seen a doctor place his ear against the shining bosom of a stiff shirt and cheerfully pat his patient on the back with the comforting assurance that his heart was all right. It is not easy to understand the weird, uncanny psychosis that allows an authoritative expression of opinion on which the working capacity, or even the life, of an individual may depend, when one cannot possibly have gotten enough data to form any intelligent opinion whatsoever.

And now one very important question comes to mind, a question not so easily answered as we might wish, namely, can we always avoid confusion and always agree? I mean even when we have studied the heart properly. The answer has to be that we cannot, and this is particularly true in regard to one of the most common, and most easily heard of all abnormal heart sounds, that is the systolic apical murmur. What is the ordinary clinician to do when Richard Cabot, working in the Massachusetts General Hospital, says, when speaking of the so-called mitral regurgitant murmur, "Such murmurs are no evidence of disease," and, again, "Mitral regurgitation should never be the only or the primary diagnosis made"; while Paul D. White, working also in the Massachusetts General Hospital, takes issue with what he calls dogmatic pronouncements, and insists that there exists as a clinical entity, especially in children, a pure mitral regurgitation, with a pure systolic apical murmur. The two men are eminent students and teachers, clearly anxious to be correct, and to make correct statements, and yet they contradict each other flatly. I must say that I greeted Dr. White's article in the *American Heart Journal*, June 1926, with a good deal of satisfaction. I had already presumed to differ with Dr. Cabot in a previous paper, and expressed the view that it was all right to caution us against paying too much attention to the systolic apical murmur, accompanied by absolutely no other evidence of disease, but it seemed to me that he had made strictures somewhat more radical than perhaps he intended. We undoubtedly, at least occasionally, see patients with a systolic apical murmur in whom the subsequent course of events, perhaps after a number of years, justifies the original diagnosis of a pure mitral regurgitation.

To return to a further discussion of the reasons why abnormal heart sounds are overlooked, and a few remarks on methods of examination. The stethoscope itself is of great importance, and we should be careful to see to it that we have a good instrument that fits our ears snugly, but comfortably. The bell of the stethoscope must be pressed firmly against the patient's body. Merely laying it gently on the chest wall is not sufficient. Murmurs that are quite loud and easily heard if the stethoscope is definitely pushed may be entirely inaudible otherwise. This is especially true of the presystolic mitral stenotic murmur. Again, in moving the stethoscope from one part of the precordium to another, we should never move it the full width of the bell, but should include in each new position a small part just previously covered, so as to be sure to examine the whole of that portion of the chest in which murmurs are ever heard. This precaution also is especially necessary in searching for the presystolic mitral murmur. The acoustic area, so to speak, of this murmur is frequently so small that, even when it is quite loud, it becomes no longer audible if we move the stethoscope a surprisingly trifling distance. We hear it in one place and think that surely we can hear it at a nearby point, but we cannot. We must go back to almost exactly the point at which it was first heard. This means, as a matter of course, that if we had accidentally, or from lack of painstaking thoroughness, missed the small area of audibility, we would not have heard it at all, and would have perhaps declared a heart free from disease when definite stenosis was present.

In order to still more carefully guard against the possibility of not hearing or not interpreting properly abnormal sounds, we must in our examinations pay careful attention to the effect of posture, respiration and exertion, and, if opportunity offers, must never be satisfied with one examination. This last precaution is imperative on account of the fact that definite murmurs are frequently transient or very variable in intensity. There does not seem to be any satisfactory explanation of this variability, but we see it so often that we must not

forget it nor, in my judgment, attempt to explain it. The simple fact in respect to this variability is emphasized by illustration. We can take a patient lying quietly on the back in a hospital and make daily examinations of the heart, taking great pains to reproduce exactly the same conditions each day, and one day hear heart murmurs far more distinctly than the preceding or the following day. This is particularly true of the double mitral, and the element that is most inconstant is the presystolic.

In regard to posture, this does not make a great deal of difference as a rule, except in our studies of the mitral valve, but is of great importance here. Very, very frequently the systolic apical murmur is better heard with the patient lying down, whereas the presystolic murmur is better heard or heard only with the patient erect. This is a mistake very easily made. It happens so often that when we for any reason listen to a patient's heart sounds, the patient is lying in bed either in the home or in a hospital, perhaps complaining of some symptoms that attract our attention to the circulation, and perhaps merely examined as a part of a routine physical. It is a very easy thing to listen, even fairly carefully, and forget that we have examined the patient in one posture only. We must never say that organic valvular disease is not present unless, if circumstances permit, we have raised the patient to a sitting posture. I have never seen any satisfactory explanation of this disappearance and reappearance of the presystolic murmur, and can only cite the fact as a reason for caution. Very loud presystolic murmurs heard in the erect posture frequently become absolutely inaudible with the patient lying down.

In regard to exercise, the usual effect of a proper response of the heart muscle to exertion is to intensify all murmurs, or render murmurs audible which were not so at rest. With the ambulant office patient some mild form of seting up exercises can be easily employed, and even with the bed-ridden patient we can frequently make use of resistance movements, or some other mild exertion. It is a matter of serious omen if a murmur easily heard at rest becomes more faint or disappears after exertion.

In regard to the effect of respiration, this is to me of value only as follows: The position of the lung during inspiration and expiration affects the intensity of a heart sound. This is merely a matter of the amount of tissue through which the sound has to be conducted. After a deep inspiration there is lung tissue in the way that is out of the way after a forced expiration, so that organic murmurs are better heard after forced expiration; and there is also one other point gained in considering respiration while we are studying heart sounds, namely, in attempting to differentiate functional murmurs from organic we can remember that the functional murmur is usually more intense at the end of a deep inspiration. This is especially true of the cardio-respiratory murmur, which seems to be due to the impact of the heart against the lung caught between the heart and the chest wall during inspiration.

It is impossible in a paper of this length to take up all heart sounds and discuss them separately, so, in conclusion, I direct your attention to the following points:

1. The mortality from heart disease is steadily increasing.

2. A negative diagnosis as to the presence of heart disease should never be made without intensive deliberate study.

3. Mitral regurgitation is a definite clinical entity, and may at first be revealed by nothing more than a pure systolic apical murmur.

4. Mitral stenosis is of all lesions the one most commonly overlooked, which is due to the fact that it is of itself inconstant and particularly altered by

5. The effect of posture, respiration and exercise.

Discussion.

Dr. Manfred Call, *Richmond:*—The most important facts in consideration of heart sounds I do not remember to have heard discussed at all. It is really more than an interpretation of murmurs, which latter may or may not be of importance. The point I wish to make is this—that to me far more information can be derived from a study of the individual valve sounds, not murmurs, than from a study of the murmur itself. For instance, a mitral lesion, whether stenosis or regurgitation, should have practically invariably an intensification of the pulmonary second due to an increased pressure in the pulmonary circulation. In aortic regurgitation, just in proportion to the extent of the lesion do we get a diminution of the aortic second sound. A close auscultatory observation of the character of the muscular element of the first sound as heard at the apex offers perhaps the best criterion of the efficiency of the heart muscle. It is to this, rather than to the interpretation of the murmurs, that I would call the attention of the Society.

Dr. J. C. Flippin, *University:*—I wish to commend Dr. Nelson for the emphasis he has placed on physical diagnosis. With the introduction, from time to

time, of newly devised aids to diagnosis, there is a tendency to neglect the simple methods of investigation. While not wishing in any way to decry the use of modern instruments and methods, without the aid of which the exceptional case can not be thoroughly understood, it still remains true that a careful physical examination will reveal all that can be determined by any method in a large percentage of cases. A careful and thorough bed-side examination with the aid of the stethoscope and a few other simple instruments continues to be and will doubtless long remain the backbone of diagnosis.

Experience in examining and observing large numbers of men during the recent war undoubtedly emphasized the frequent occurrence of systolic murmurs, and the fact that this murmur is in most cases without significance. I can not help but feel, however, that Dr. Cabot and certain prominent English clinicians have become a bit extreme in their views on the diagnosis of mitral insufficiency.

DR. NELSON, (*closing the discussion*):—I want to thank Dr. Call and Dr. Flippin for discussing my paper and thank them both for what they said. Dr. Call has added to what I had in the paper. As I stated in the beginning, it is impossible to take up in a paper of that length all the sounds of the heart. The purpose of my paper has been emphasized by Dr. Flippin. I know myself that when I am hurried, on days when I am busy, I have a tendency not to employ what I know. I read that paper more to emphasize to my own mind the need for caution, the need for deliberate study of the heart. You can not listen to a heart for a few minutes and make any pronouncement about it. It has to be careful, deliberate study, just as a child studies its lessons for school, and I emphasized in the paper the things I find myself sometimes inclined to overlook.

PURPURA OF THE URINARY TRACT.*

By JOSEPH F. GEISINGER, M. D., Richmond, Va.

Purpuric phenomena within the urinary apparatus have received but scant and inconstant attention in the consideration of the important symptom of hematuria. It is not unlikely, however, that they occur more frequently than statistics would indicate, and that they underlie some of the puzzling cases in which even the most vigilant urologist has been unable at times to disclose either the source or the cause of bloody urine.

Hematuria associated with purpuric or erythematous manifestations elsewhere in the body, and presumably of the same etiologic connections, is, of course, anything but rare. Records of many such cases have come from the medical clinics and the recognized texts contain comprehensive discussions of the supposed pathologic physiology which permits the contents of the blood vessels to escape into the tissues. In these cases, however, the hematuria, if not actually insignificant by comparison with the more clearly defined surface purpura present at the same time, is so obviously due to a general vascular or hematopoietic disturbance that it receives no independent consideration and rarely comes to the urologist for investigation.

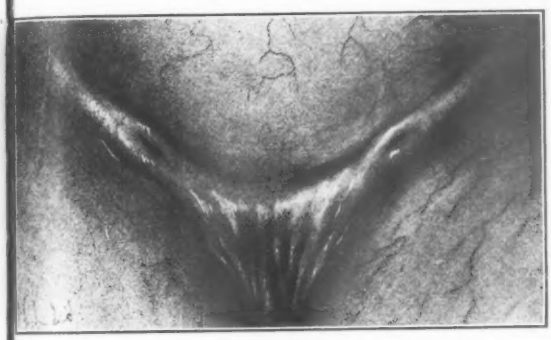
On the other hand, hematuria due to a purpuric condition confined (and therefore concealed) within the urinary tract has been recorded but rarely,—and it is this type to which the writer directs attention, with the addition of one case under his own observation. In this group there is nothing in the general condition or appearance of the patient to suggest the actual lesion. The case goes not to the medical clinic, as a rule, but to the urologist, upon the presumption that the bleeding is due to one of the causes commonly present in such a situation,—calculus, tuberculosis, neoplasm, infection. The urologist conducts an exhaustive study and finds none of these conditions. The purpuric picture may be intensely present in the bladder and offer a ready explanation. On the other hand, the bladder may show no involvement, but blood may be seen coming from kidneys, into which the urologist cannot look; and in the absence of any other explanation the case may be recorded as one of essential or idiopathic hematuria. Finally, the bleeding may have stopped entirely and exist only in the history, and the bladder, under the eye of the urologist, will give no clue to the fact that but recently it was itself the seat of a hundred small hemorrhages. The case will then go into the baffling group of those in which not only the etiology but also the site of the bleeding is undisclosed.

The most elaborate consideration of the subject, with which the writer is familiar, is that by Stevens and Peters in 1919 in connection with the exhibition of thirty-seven cases observed among the troops in France during the late war. The remainder of the literature consists of an occasional fragmentary report, usually from some foreign source.

In the cases presented by Stevens and Peters, who considered them to represent a new disease, the onset was acute, with irregular and insignificant prodromata. The fully developed clinical picture showed pyrexia, marked prostration and general malaise, headache, pains in the legs and back, gross hematuria, dysuria, frequency of urination, cylinduria, reduction of phenolsulphonephthalein output. The order of appearance of the symptoms varied, as

*Read before the fifty-seventh annual meeting of the Medical Society of Virginia, at Norfolk, Va., October 12-15, 1926.

did their relative severity. The disease tended to run a prolonged sub-acute or chronic course, with occasional acute relapses. The lumbar pain was sometimes as severe as true renal colic and was presumed to be due to the passage of clots. Casts were present in the urine of practically all cases and the dye output registered a definite depression of function; the common signs and symptoms of nephritis, however, were noticeably absent. Uremic manifestations were lacking and edema and dyspnea were rare. The blood pressure was never elevated above normal limits. The blood itself presented nothing of any significance. No leucocytosis occurred. Late in the disease a slight secondary anemia was found. No observations were recorded with reference to coagulation time or the platelet count,—a rather important omission. The cystoscopic



Normal trigone and adjacent area of bladder wall.

picture was always striking and was essential to the diagnosis,—small hemorrhages into the mucosa, numbering from two to over a hundred, and ranging in size from petechial spots to 1 cm. in diameter. When gross hematuria existed at the time of cystoscopy, blood was clearly seen to come from both ureteral orifices. At no time was any blood seen oozing from the hemorrhagic mucosa. Subsequent cystoscopies showed a tendency of the lesions to clear up with great rapidity. Microscopic examination of small bits of tissue removed through the cystoscope exhibited submucous hemorrhages unaccompanied by any of the signs of inflammation. Bacteriologic examination of blood and urine proved negative. Attempts to determine the etiology of the condition or to identify it with any known disease were unsuccessful. There was no direct evidence that its incidence was dependent upon the special conditions occurring in war, and it seemed quite possible to the authors that cases of the disease might occur in civil life. Finally, they declare:

"The evidence that we are dealing with a clinical entity is merely circumstantial, but the appearance in a considerable number of cases of a distinctive pathologic and clinical syndrome hitherto unreported is hardly conceivable as a fortuitous series of coincidences. The bladder hemorrhages cannot at present be distinguished from any other purpuric lesions; but a purpura of such frequent occurrence, which is apparently limited, in at least a large proportion of cases, to the urinary tract, is sufficiently extraordinary to command attention."

Report of a Case.

The patient, a white woman, now 32 years of age and the mother of seven children, came under observation first in 1921, and has reported for advice or treatment at irregular intervals since that time.

The collateral history presents nothing of any particular significance with the exception of a tendency to excessive nose bleeding in her husband and all of her children, but never in herself. At no time has she ever had a suggestion of purpura or erythema on her skin surfaces, and she has never observed any prolongation of bleeding after slight injuries, but rather the contrary. She has spent her entire life in Richmond and has never been anywhere near the tropics.

Frequent child-bearing, exacting household duties, and the urinary disturbance, to be detailed subsequently, have kept her in a state of chronic ill health. Her appetite and digestion have continued good and her bowels behave normally; there has been no blood from the rectum. Menstruation is regular and painless, but very profuse and sometimes lasts fifteen days. In recent years there has been considerable leucorrheal discharge. About eighteen years ago she had a suspension of her uterus, which was supposed to be disturbing her bladder by pressure; at the same time her appendix, said to be adherent to her right ovary, was removed. This operation gave her considerable relief until eight years ago, when her bladder disturbance recurred. Five years ago a perineal tear was repaired.

It was shortly after this operation that the patient first came into the hands of the writer, on account of bloody urine. As intimated above, she had suffered bladder distress, consisting of burning and frequency, for many years, but this was her first spell of hematuria, and was so profuse that she was alarmed and sought explanation immediately. This was in December, 1921. A cystoscopic investigation was made the next day and disclosed an astonishing picture. With the exception of the anterior half of the trigone, the bladder mucosa throughout was studded with ecchymotic spots varying in size from a pin-head to a dime. Such small uninvolved areas as were visible between these spots did not appear to be inflamed. No actual bleeding was present at the time and the urine which had previously been full of blood was now quite clear. Both ureters were catheterized and the separated urines were entirely normal. A differential function

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test was done, but, owing to leakage alongside the catheters, was inconclusive so far as the kidneys individually were concerned; the total dye output, however, was somewhat above normal. Stains for tubercle bacilli were negative.

Following this manipulation the patient had some further bleeding, and three days later suffered severe pain in her lower left abdomen, from which she suddenly obtained relief coincidently with the passage of milky urine of such character that she concluded an "abscess had ruptured." Examination of this specimen showed the cloud to be due, not to pus, as presumed, but "to presence of chyle, probably due to rupture of lymph vessels into bladder." (Dr. E. G. Hopkins, pathologist).

and a fever of from 101° to 103°. There were no other symptoms. Her bladder had been quiescent for sometime; there had been no bleeding and there was none in this spell. In her previous disturbances there had been no fever and her white blood count had been normal; now there was a definite leucocytosis. The urinalysis, however, was practically negative for infection, though it showed acetone, diacetic acid, mucus, and a trace of albumin. She was exquisitely sensitive over her left kidney, which was palpable but not enlarged. Upon the presumption that she had a left renal infection, with a blockage of her ureter, cystoscopic investigation was made. The base of the bladder was somewhat edematous, but otherwise negative. The expected obstruction

Trigone and adjacent bladder wall in case here reported. Note almost innumerable hemorrhagic areas. The same picture was present throughout the entire remainder of the bladder.

The patient was lost to sight for a little more than a year, when she returned stating that she had passed no more blood or chyle, but had continued to suffer with burning, frequent urination and pain along the course of both ureters, especially on the left side. Urinalysis at this time was negative, but, in view of her symptoms, a cystoscopic investigation was again made. The bladder exhibited slight congestion of the trigone, but was otherwise negative, giving no hint of its previous condition. Specimens from the kidneys were entirely negative microscopically and culturally.

After this, the patient was not again seen until March, 1925, when she suffered an attack of violent pain in her left renal area, accompanied by chills

in the left ureter was not present; a large catheter was passed readily. There was no retention in the pelvis and the urine was quite clear. An X-ray plate was negative for shadows; a pyelogram showed slight dilatation of the pelvis, which was otherwise entirely normal. The function of this kidney, as indicated by the dye test, was definitely above normal. Artificial distention of the pelvis classically reproduced the patient's pain. The catheter was retained for about twenty-four hours, during which period the urine became quite bloody; it was impossible to estimate how much of this bleeding was due to catheter traumatism. The fever and pain promptly subsided and the patient left the hospital in two days greatly improved.

One year later she again returned. At intervals she had continued to have burning, frequent urination, with occasional attacks of pain in her left renal area, but without bleeding until the present spell. This spell was ushered in with fever which lasted nearly a week. Then, on March 8, 1926, after a day of great bladder disturbance, she began to strain and passed a great deal of blood along with chunks of "flesh"; some of the latter were an inch long and did not look like clots. The bleeding continued all night, with much pain in the left side, but no fever. On the following day she reported for advice and was immediately cystoscoped. The bladder picture was now a precise duplication of what it had been nearly five years previously. The mucosa was universally splashed with ecchymoses, with the exception of the anterior half of the trigone. There were many hundreds of these spots, with narrow uninvolved areas between. No active bleeding was visible anywhere; the urine showed a few pus cells, but no blood. After twenty-four hours the bladder was again inspected. With the exception of a few of the larger splotches, the ecchymoses had nearly all disappeared, leaving an edematous, congested appearance of the mucosa. The bladder urine contained a considerable amount of pus, but no blood; the left kidney urine was negative for pus. In fifteen minutes 20% of phenolsulphonephthalein was eliminated from the left kidney and 25% from the right, the normal being 15%.

Following this examination, the patient continued uncomfortable, and again had bloody urine with a foul odor and also some fleshy shreds Six days later (Maarch 16, 1926), the bladder, on cystoscopic examination, gave no suggestion whatever of its previous condition, but appeared to be the seat of a low-grade cystitis; the urine now contained a small amount of blood and pus. One month later this urine was absolutely negative; the patient herself was definitely better, but still had spells of burning urination and much aching in her left abdomen and back.

In the five or six months that have elapsed since this date, the condition of the patient has not materially altered. Bladder disturbance occurs at intervals, and pain in her left side is often quite bad. More and more has she become impressed with an association between her menstruation and her exacerbations of this pain; her periods are profuse and last a week or more; the discharge is often offensive; her side begins to ache a week before the flow starts and continues to ache until it stops. Then, usually, though not always, she has some relief until menstruation again approaches.

A considerable mass of laboratory and other data has been assembled in connection with her condition. Her blood picture presents none of the characteristics of a true purpura hemorrhagica. Her platelet count is 200,000. Not only was there no prolongation of her bleeding time, but after a deep stick with a three-cornered needle she would not bleed at all without pressure. After twelve hours her blood clot contracted completely, squeezing out all of its serum. In the middle of one of her spells of hematuria her red blood count was 4,776,000 cells, with hemaglobin of 75%. The white cells were 9,600, polys 75%; small lymphocytes 19%; large lymphocytes 6%. The smear showed some poikilocytosis and a considerable degree of anisocytosis. The stool was negative for blood, parasites, or ova. The dye output from the kidneys has been normal. At the same time, blood chemistry showed urea nitrogen 20 mg.; creatinin 1.3 mg., and sugar 88 mg. In the course of one of the cystoscopic examinations a small bit of tissue was removed with rongeur forceps from the ecchymotic bladder wall. On microscopic examination (Dr. Charles Phillips), this was found to exhibit "a chronic inflammatory reaction under a poorly defined and edematous mucous membrane. There is considerable hemorrhage throughout; a great many polynuclear and eosinophilic leucocytes. There is an extensive round cell infiltration and fibrosis. There are a few blood vessels present, but the specimen is not very vascular. There is a definite suggestion of tuberculosis, but only a suggestion, in the general arrangement of the chronic inflammatory reaction." The urine has been stained frequently for tubercle bacilli, but none have been found; guinea pig inoculation has also been negative.

A general physical examination by a competent internist disclosed nothing of any striking significance in connection with the possbility that the urinary purpura in this case might be symptomatic of pathology elsewhere in the body. The outstanding finding here was a definite focus of infection in the tonsils, smears from which showed pus, staphylococci, and Vincent's angina. The lungs were essentially negative. The circulation seemed good; a soft systolic murmur was heard over the precordium, more distinct in the pulmonic area; blood pressure, 130 systolic; 86 diastolic. Reflexes were normal. The eye grounds showed nothing unusual.

On pelvic examination the uterus was found anterior, with the fundus enlarged, boggy, and very sensitive to manipulation. No gross masses were palpable in the adnexal regions. The cervix was lacerated, hypertrophied, chronically inflamed and eroded. In view of these pelvic findings, the fact that the patient has borne seven children, the increased burden of prolonged profuse menstruation, and the apparent connection between the pelvic physiology and the urinary pathology, there would seem to be good reason to break the cycle, if one exists, and at the same time remove an organ which, as the patient approaches the menopause, may, in its present condition, become a serious menace to her. As her domestic situation does not permit her at this time to enter a hospital for operation, she is being submitted to X-ray treatment tentatively. In addition, the cervix will be treated locally by diathermy and otherwise if necessary; her tonsils will be removed as soon as possible, and her urinary complications will be met according to circumstances, as in the past. The outcome lies in the future, and is, therefore, a matter of mere speculation.

It seems unquestionable that this case belongs to the supposedly rare type distinguished by purpuric manifestations limited to the urinary tract. Absence of characteristic blood findings, especially in reference to the platelet count, exclude it from the purpura hemorrhagica group. More likely it is a secondary or symptomatic purpura, the underlying factor in which is not clearly defined. This factor may be represented by the infection in the tonsils, or in the cervix uteri, or both. On the other hand, it may be expressed by a less pathological and more physiological connection between urinary bleeding and menstrual bleeding. Finally, there may be some local condition in the ultimate ramifications of the

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urinary vascular tree permitting the capillary contents to pass into the tissues under certain circumstances.

In some respects the case resembles those described by Stevens and Peters, but in other respects it differs radically. At no time was any blood observed coming from the kidneys prior to catheterization; hence, it cannot be said that the kidneys were actually involved, though the persistent left renal pain would tend to indicate this. Casts were never found in the urine and the renal function, instead of being depressed, was actually accelerated. The degree of involvement of the bladder wall was much more extensive in this case. Finally, the appearance of chyluria in the course of one attack was most unusual. Non-parasitic chyluria is itself so uncommon as to invite comment and discussion. Various theories as to its etiology have been advanced; the most generally accepted presumes some obstruction to the lymphatic drainage resulting in back pressure sufficient to cause dispersion of the chyle through the vessel walls. There is no obvious obstructive element in this case. At all events, first blood and then chyle have appeared in the urine of this patient, and it is possible that both resulted from "rupture" of vessels, as indicated by the keenly observant E. G. Hopkins in his original report. The cause of the rupture itself is another matter, as yet unexplained.

The extraordinary evanescence of the visible bladder lesion is mentioned by Stevens and Peters and is strikingly illustrated in this case. This aspect of the phenomenon is extremely interesting and possibly important in the matter of diagnosis. The presence of purpura of the urinary tract can never be conclusively determined without a demonstration of the characteristic bladder picture. With a picture that vanishes so speedily it is manifestly easier to miss it than otherwise. Conceivably, therefore, it is present in the clinical field oftener than it is disclosed, and herein may possibly lie an occasional explanation for some of the hematurias of unknown origin. Furthermore, as indicated above, it is quite likely that at times the kidney, the pelvis, and the ureter, singly or in combination, may be the seat of a purpuric process without involvement of the bladder. In such an event, though blood be visible at the ureteral os when the inspection is made, its real nature is completely concealed, and since no other causes are obvious, the diagnosis of idiopathic hematuria would follow as a matter of course.

Stuart Circle Hospital.

THE RETICULO-ENDOTHELIAL SYSTEM WITH SPECIAL REFENCE TO THE LYMPHOCYTE.*

By H. E. JORDAN, Ph.D., University, Va.
Medical School, University of Virginia.

The designation reticulo-endothelial system was proposed by Aschoff and Landau (1913) as an inclusive term for widely distributed collections and free-cell derivatives of reticular connective tissue and of blood-vascular and lymph-vascular endothelium, co-operating in the function primarily of intense and frequent phagocytosis, particularly of senile blood cells, tissue debris and micro-organisms. Employed in this sense, as designating a group of cells possessing common morphologic and physiologic properties of a very special character, the term is one of great convenience, and has come to be widely adopted, especially in pathology.

The reticulo-endothelial system includes thus the Kupffer cells of the liver, the splenic monocytes ("splenocytes"), the so-called macrophages (in contrast with the polymorphonucleated special granulocytes, the "microphages"), endothelial leucocytes (phagocytes), histiocytes, adventitial cells, clasmatocytes, and the "polyblasts" of Maximow. It comprehends furthermore the sinusoidal and capillary endothelium of the spleen, bone marrow, lymph nodes, hemal nodes, liver, lungs, hypophysis cerebri and the suprarenal cortex. It includes also the reticular connective tissue of these same organs and tissues, and of the tonsils and thymus. The greater and more active portion of the reticulo-endothelial system in mammals resides in the spleen; next in bulk and activity is apparently that portion included within the red bone-marrow; that of the lymph and hemal nodes would seem to occupy normally the tertiary level. The various types of free phagocytes of this system take origin from the reticulum and endothelial cells of the included tissues, or from the lymphocyte derivatives of the constituent parent cells. Various functions more or less confidently ascribed to the spleen, including blood-cell formation and destruction, iron metabolism, antibody formation, fat metabolism, etc., are all supposed to be related to the reticulo-endothelial complex.

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*Read before the fifty-seventh annual meeting of the Medical Society of Virginia, at Norfolk, October 12-15, 1926.

Besides its extensive phagocytic function, the reticulo-endothelial system as a whole is also intimately involved in the function of blood formation. The specific derivatives of this system in the various hemopoietic foci whose function is that of ancestors to erythrocytes and granulocytes have been designated *hemohistioblasts* by Ferrata (1914). The intermediate stage between the reticulo-endothelial tissue, or, specifically, the hemohistioblast element of the system, and the future blood cell may again be a lymphocyte-like cell, the so-called hemocytoblast. Depending upon the specific type of stimulus, the lymphocyte derivative of the endothelial or reticular tissue may differentiate either into the various types of phagocytes or into specific blood cells.

In the entire system blood-cell formation and blood-cell destruction may be coincident processes of variable degree. Moreover, the ancestral tissues of these two functionally divergent groups of cells are originally apparently identical. The difference in developmental direction and function would seem to be a matter of difference of specific stimuli impinging upon polyvalent and potentially identical cells. Moreover, in the case of either route of differentiation, phagocytic or hemopoietic, the lymphocyte constitutes an early intermediate stage in which the original polyvalency of the parent mesenchyma has been retained to a high degree.

Closely related to the phagocytic blood destructive function of the reticulo-endothelial system is that of bile-pigment production. This function is largely intrahepatic in the case of birds, intrasplenic in the case of the dog and other mammals (Aschoff, 1924). This system is concerned also in a still disputed and uncertain degree with antigen-binding and antibody-producing functions in the body's defence reactions against bacterial infections; and in general ferment production. Its participation in general metabolic functions, e. g., storage and metabolism of iron, metabolism of fats and proteins, is also more or less clearly indicated by various experiments detailed by Aschoff.

We are interested in this connection chiefly with the role of the reticulo-endothelial system in blood-formation, and especially with the relation of the lymphocyte to this process.

The limits of the system should first be clearly defined. The best criterion for this purpose is its reaction to certain dyes. When dyes like lithium carmine or trypan-blue in solution are injected into experimental mammals, certain cells of the connective tissue series stain more intensely than others. This was first demonstrated by Ribbert ('04). Investigation of this system by means of colloidal dyes has since been greatly extended by Goldman ('09), Kiyono ('14), and their students. The deeply staining cellular constituents may be collectively designated chromophils, the lightly staining chromophobes. However, it must be emphasized that the difference between these two groups of cells is not one of positive and negative reaction, but simply one of degree of intensity of positive reaction. The line of demarcation between the two groups in adults must therefore be more or less arbitrarily drawn. In the embryo the line is entirely absent. The entire system, including the parent mesenchyme, is almost uniformly chromophilic. Under the chromophobes in adult mammals Aschoff classifies: 1, the endothelial cells of the blood and lymph vessels; 2, the fibrocytes, or ordinary connective tissue cells. The chromophils include: 1, the reticulum cells of the splenic pulp, and of the cortical nodules and pulp cords of lymph nodes; 2, the endothelial cells of the sinuses of the lymph nodes, the blood sinuses of the spleen, the capillaries of the liver lobules (including Kupffer's stellate cells), the capillaries of the bone marrow, the adrenal cortex and the pituitary gland. This chromophil group constitutes the specific reticulo-endothelial system of Aschoff. Chromophil free-cell derivatives of this system include the wandering cells of the connective tissues (histiocytes of Kiyono; clasmatocytes of Ranvier), and the splenic and circulatory monocytes. The chromophil group includes also the hemohistioblasts of Ferrata. These are capable of differentiating either into blood elements or into chromophobe connective tissue.

In the embryo even the aortic endothelium constitutes functionally part of the reticulo-endothelial system. Subsequently, the system, as regards endothelium, becomes more and more restricted to the sinusoids and capillaries of certain organs. But during the second month the endothelium of the midventral portion of the abdominal aorta, in relation to the caudally migrating celiac axis, and the superior and inferior mesenteric arteries, proliferates locally to form so-called aortic cell clusters, the elements of which differentiate into red blood cells (Jordan, '16, '17 and '18). More-

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over, under pathologic conditions endothelium anywhere may liberate phagocytes (Foot, '25).

The most recondite matter in this connection concerns the degree of genetic relationship between the reticulo-endothelial apparatus and the lymphocytes. Aschoff makes the categorical statement that we must still insist upon a definite distinction between reticulum cells on the one hand and lymphocytes on the other. However, more recent investigations apparently show conclusively that lymphocytes differentiate directly from reticulum cells; and, further, that under certain conditions lymphocytes may differentiate directly also into phagocytes or into specific blood cells, either granulocytes or erythrocytes.

The difference in intravitam staining reaction between the lymphocytes of the spleen and of the lymph nodes, the former being chromophilic like reticulum cells generally, the latter chromophobic, may be simply a matter of degree of differentiation along the line of phagocytosis.

Histologic study of the spleen and lymph nodes seems to show that lymphocytes differentiate from the reticular stroma, large lymphocytes from the larger reticulum cells, small lymphocytes from smaller reticulum cells. However, simple study of sections, no matter how favorable, always leaves a degree of uncertainty regarding the actual process of transformation. This is obviated in tissue culture study. Such studies have been made by Chlopin and Chlopin ('24). In tissue cultures of the spleen of a salamander, Axolotl, they report and illustrate the actual transition from reticulum cell to lymphocyte. Maximow ('22) had previously recorded a similar result in the case of tissue cultures of lymph nodes of the rabbit. Lymphocytes are accordingly to be regarded as free-cell constituents of the reticulo-endothelial system. However, in mammals they apparently do not answer to the specific criteria for cells of the system, namely, deep-staining reaction to intravitam administration of colloidal dyes and intense phagocytic activity. But such specific reactions can be induced under certain conditions. Downey ('17) shows that in a segment of the femoral vein, isolated by double ligature, the lymphocytes phagocytose pyrrhol-blue and become typical chromophils. Under these conditions lymphocytes have become rapidly converted into typical monocytes, specific free-cell portions of the reticulo-endothelial system.

Simpson ('21) has claimed to be able to differentiate between lymphocytes and monocytes in certain mammals on the basis of a differential response to the supravital application of neutral red, trypan-blue, etc. Lymphocytes are said never to contain more than eight stained globules of a so-called "segregation apparatus," monocytes are said to contain from 40 to 60 such globules. Simpson claims that no transition forms occur with regard to the number of stained globules between lymphocytes and monocytes. However, I have been able to show by employing a similar supravital staining technic, that in the case of the blood of the frog this criterion for differentiating between monocytes and lymphocytes completely breaks down. Here there occurs a closely graded series of transition stages between mononuclear lymphocyte-like cells with few stained granules and similar cells with many globules.

Moreover, by injecting India ink into the dorsal lymph sac of the frog, and then examining specimens of blood at regular intervals, it can be demonstrated that while typical monocytes, of relatively large size and with reniform nucleus, first and almost immediately pick up the carbon particles in large numbers, after the end of twenty-four hours even the small lymphocytes also phagocytose large numbers of these particles. Under the experimental conditions calling for intense and widespread phagocytic activity, typical lymphocytes are stimulated to behave like typical monocytes.

As regards phagocytic activity, therefore, the lymphocytes are capable under certain conditions of expressing one aspect of their primitive polyvalency, to the exclusion of other potencies and then function as typical phagocytes, indistinguishable from monocytes. Lymphocytes thus may speedily differentiate into monocytes. In other words, lymphocytes are as truly a part of the reticulo-endothelial system as are the Kupffer cells or the ubiquitous monocytes. They constitute a circulatory portion of the reticulo-endothelial system. They have actually separated from reticular stroma, and maintain their primitive potential capacity of phagocytosis. In another sense, the formation and distribution of lymphocytes may be regarded as the most efficacious method for quickly mobilizing in case of need, portions of the reticulo-endothelial system capable of quickly differentiating into the required type of cell.

The interpretation of the lymphocyte as a

relatively undifferentiated mesenchymal derivative, endowed with multiple developmental potentialities, the expression of any particular one depending upon what specific stimulus may impinge upon it in greatest degree, is greatly weakened since it rests heavily upon Amphibian material if we accept the claim of Alder and Huber ('23) that amphibia and reptiles lack true lymphocytes. These investigators assert that genuine lymphocytes do not occur in forms below birds. The cell of amphibian blood, with all the morphologic features of a lymphocyte, they regard as a circulatory hemocytoblast, a parent cell of erythrocytes and granulocytes. However, there would appear to be no justification on histologic or physiologic grounds for restricting the term lymphocyte to super-reptilian bloods, and thus denying for the lymphocyte of mammalian bloods the same hemocytogenic and phagocytogenic function possessed by the lymphocyte of amphibia. On the contrary, comparative hematology shows fairly clearly that earlier blood cells are exclusively lymphocyte-like forms, and that during racial history the various specific forms of red and white blood cells have developed from this common mother cell. In individual history, as in racial history, the lymphocyte would seem actually to be the common hemocytoblast. As regards lymph nodes, while it is true that these occur typically only in certain birds and in mammals, their beginnings are already foreshadowed in various aggregations of lymphocytes in amphibia and reptiles.

The case is very similar as regards the relation of the reticulo-endothelial system to blood formation. In the various hemopoietic organs, yolk-sac, spleen, liver, bone-marrow,—even in the thymus and lymph nodes under certain conditions,—erythrocytes and leucocytes differentiate from the elements of this system, either reticulum cells or endothelium. Such cells of the reticulo-endothelial system, with a hemogenic bias, constitute the hemohistioblasts of Ferrata. As free cell derivatives they are known as hemocytoblasts. These may differentiate, depending upon specific stimuli, either into erythrocytes, monocytes or granulocytes. These hemocytoblasts are very like lymphocytes. The case with which a closely graded series of transition stages between typical hemocytoblasts with nucleolus, and typical lymphocytes with coarsely granular nucleus without nucleoli, may be arranged in active hemopoietic tissues, suggests a close genetic relationship. Indeed, the evidence is now fairly complete that typical lymphocytes may actually under certain conditions differentiate into erythrocytes and granulocytes. The earlier evidence was again exclusively histologic, e. g., Badertscher ('15), Lalta ('21), etc. More recently Chlopin and Chlopin ('25) in their tissue culture experiments have demonstrated that typical lymphocytes differentiate directly into granulocytes, special and eosinophilic. And while they assert that erythrocytes arise directly from reticulum cells, the hemohistioblasts, their illustrations nevertheless show a lymphocyte transition stage.

I am now in possession of histologic material which demonstrates the same point. This material consists of a submaxillary lymph node of a rabbit, three human lymph nodes in connection with the parotid gland, and two abdominal lymph nodes of the dog. They vary considerably in respect of details, but agree in showing the direct transformation of lymphocytes into erythrocytes. I may, therefore, confine this description to the rabbit's lymph node. This node is apparently disconnected from the lymphatics. Its cortical portion consists of a thin discoid mass of lymphocytes without trace of nodules. No peripheral lymph sinus is discernible. Many of these lymphocytes are in process of degeneration; certain groups immediately adjacent to the blood vessels are at various stages of differentiation into erythrocytes. The wide medulla consists of narrow cords and wide irregular sinuses. These medullary sinuses have a wide-meshed stroma of irregular reticular cells, many apparently in stages of degeneration. They contain also occasional erythroblasts and lymphocytes. The node as a whole lacks fat cells, granular leucocytes and phagocytes.

The medullary cords are of primary interest and importance in this connection. The majority contain an axial thin-walled blood vessel with more or less stagnant blood; some are "solid" without remnant of blood vessel; a few are in transition stages, showing the obliteration of a central blood vessel by disruption of its wall and cellular invasion of its lumen. All of the cords are enveloped by an epithelioid membrane, of reticulum cell origin, indistinguishable from endothelium. This reticulum endothelium is continuous proximally with the proper endothelium of a cordal blood vessel. Thus originally extravascular cells become transferred en masse intravascularly.

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The evidence is in accord with Downey's recent conclusion, accepted by Aschoff, that "reticulum cells and endothelial cells are one and the same type of cells." The majority of the cells of the cords are at some stage of transformation into erythrocytes. Some of the more peripheral cells are suffering karyorrhexis. The cords in the later stages of transformation practically lack reticular stroma. Here the reticulum cells have differentiated into lymphocytes; and the latter, under the influence of transudation products of the stagnant blood, most probably a matter essentially of an increased concentration of carbon dioxide, are becoming transformed into erythrocytes. Most of these differentiating lymphocytes are at normoblast stages, a few at late erythroblast stages with much hemoglobin in their cytoplasm. This material would seem to furnish a clear demonstration of the capacity on the part of the lymphocytes to differentiate under certain conditions into red blood cells. Most likely lymphocytes transported to the red bone marrow pass through a similar history of transformation into red blood cells. Indeed, such history may be the answer in large part to the persisting enigma regarding the fate of the vast number of lymphocytes which daily leave the blood stream. This hypothesis of lymphocyte fate at least obviates more adequately than any other the vast discrepancy between the number of lymphocytes known to be daily lost and the number whose disappearance can be accounted for by an observable route, such as the intestinal epithelium.

From the standpoint of hemocytopoiesis then, no less than from that of phagocytopoiesis, the lymphocyte represents a free-cell circulatory portion of the reticulo-endothelial system. It is formed largely in the spleen and lymph nodes and differentiates under the more favorable conditions prevailing in the red marrow, largely into erythrocytes and granulocytes. Instead of separating the lymphocyte from the reticulo-endothelial system, it may actually be considered as almost its most important element. Depending upon variable conditions, it answers to all the specific criteria of this system; origin from reticulum or endothelium, ability to differentiate into a phagocytic cell with a high degree of activity, and ability to function as a red-cell ancestor. The varied and interchangeable developmental ability of reticulum, endothelium, and lymphocytes is explicable on the basis of the close genetic relationship of these three tissues and their low degree of differentiation with respect to the polyvalent parent mesenchyme. Even the lymphocyte maintains this original polyvalency, and like endothelium and reticulum may, depending upon conditions, differentiate into phagocytes, granular leucocytes or erythrocytes.

The varied and extensive function of the reticulo-endothelial system in normal histology, suggests its varied involvement in pathologic histology. Thus, according to Aschoff, this system becomes secondarily involved in Gaucher's disease, and in certain cases of hemochromatosis. The splenomegaly of Banti's disease apparently represents a primary hyperactivity of the reticulo-endothelial system: similarly in the case of monocytic leucemia, and possibly other forms of leucemia, and in pernicious anemia. And, finally, true neoplasms of the reticulo-endothelial system also probably occur, among which, according to Aschoff's suggestion, may be classified certain of the primary endotheliomas of the spleen, bone marrow and lymph nodes, so carefully studied and fully described by Ewing ('22). The lymphosarcomas would represent tumors of this class in which the lymphocyte element of this system preponderates.

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Discussion

Dr. J. Shelton Horsley, *Richmond:*—We owe a distinct debt of gratitude to Dr. Jordan for this paper. The discussion of the reticulo-endothelial system at present is very timely. Coming from one of the great authorities on histology, it is of particular interest.

This designation proposed by Aschoff and Landau, in 1913, has attracted much attention. Dr. Jordan, in discussing the reticulo-endothelial system, has not only reviewed the literature, and the work of Aschoff, but has brought in more recent research and particularly the very valuable work of Dr. Jordan and his associates on the lymphocytes.

The lymphocyte seems to be getting its just dues from Dr. Jordan, who has demonstrated that it is a most important factor in the histogenesis of the blood, being an ancestor of both the red and the white corpuscles, besides having other ancestral duties that are not well established, such as the fixed connective tissue cells and a very close resemblance to the osteoblast. It is important to remember that the reticulo-endothelial system is not sharply defined. The prime requisite for cells to be admitted to the reticulo-endothelial system is phagocytosis. Under unusual conditions many cells are capable of phagocytosis that ordinarily are not considered phagocytes. The tests for degrees of phagocytosis for determining the reticulo-endothelial system have been intra-vitam staining by lithium carmine, trypan-blue, and other allied dyes. The cells taking up the dye granules most abundantly are considered to be most strongly phagocytic. Those that stain but weakly, taking up few of the granules, are poorly phagocytic. Aschoff gives six classes of cells which take up the stain to a greater or less extent, but limits the reticulo-endothelial system to two classes, that is, the reticulum cells of the splenic pulp, the cortical nodules and pulp cords of the lymph nodes, and ultimately of the remainder of the lymphoid apparatus, as well as the reticulo-endothelial cells of the sinuses of the lymph nodes, the blood sinuses of the spleen, the capillaries of the liver lobules (Kupffer's stellate cells), the capillaries of the bone marrow, the adrenal cortex, and the hypophysis. Other cells which take up the stain less readily, though are stained to some extent, are not included in this classification.

By this ruling the lymphocyte seems to be left out, because it is stained very slightly and has, according to Aschoff, but little if any phagocytic property. Dr. Jordan has shown, however, that under certain conditions the lymphocyte may become phagocytic and may also quickly give rise to other cells, such as monocytes, which are always strongly phagocytic. The appearance of granules in the cytoplasm seems to be a requisite for phagocytosis, but Dr. Jordan has shown that the lymphocyte may give rise to other white blood cells as well as to red blood cells, and sometimes the transition to other white blood cells is quickly made, and under certain conditions the lymphocyte itself can be phagocytic.

The property of phagocytosis being the chief quality of the cells of the reticulo-endothelial system, it is obvious that they concern not only the destruction and disposal of dead red blood cells and degenerating white cells, but that they have much to do with the attack of bacteria. They are concerned, too, not only with acute infections, but with many poorly understood chronic toxic conditions. The excessive action of the reticulo-endothelial system has necessarily some relation in certain diseases to

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the destruction of red blood cells and primary anemia. On the other hand, an over production of certain of the cells in the reticulo-endothelial system, such as particularly the monocytes, may be responsible for types of leukemia.

This disarrangement of the cells of the reticulo-endothelial system is strikingly like malignant tumors in many instances. The cells become too abundant, toxic material is elaborated, the cells grow without law and order, frequently not going through the normal cycle of maturity, and in other ways resemble malignancy, though instead of having a solid stroma the stroma is the blood plasma. Ewing particularly has studied the primary endotheliomas of the bone marrow, an endothelioma which is called after Ewing's name. In addition to this, if we include the lymphocytes, as Dr. Jordan very properly seems to do, diseases of the lymph nodes such as lymphosarcoma must be taken as another clinical manifestation of pathology in the reticulo-endothelial system. Hodgkin's disease is from the reticulo-endothelial system.

The importance of this system, not only in diseases such as infection, even in typhoid and in other diseases in which a leukocytosis is not ordinarily looked for, and probably in the induction of certain types of immunity, is very great. The normal physiologic workings of the reticulo-endothelial system are, of course, highly important. Dr. Jordan seems to have demonstrated from his studies of the lymph node of a rabbit and in other ways that the lymphocyte is a direct ancestor of the red blood cell, and this may account for the large number of lymphocytes that are normally produced whose disappearance cannot be always accounted for by processes of digestion and other ways. If we can conceive that the lymphocyte gives origin to the red blood cell, in many instances this is the natural physiologic method for the disappearance of the lymphocyte that has not often heretofore been considered.

It is well known that aside from disposing of worn-out red blood cells and other cells and giving up the hemoglobin to form bile pigment, the leukocytes play a very vital part in normal absorption of food from the intestinal tract, and particularly of fats. In the process of this absorption any lymphocyte which surrounds the droplet of fat and takes part in the transition of this fat from the lumen of the intestine to the tissues undergoes, of course, destruction. Probably they are also concerned in the absorption of proteins and carbohydrates, but not in such an obvious way.

DR. HARRY T. MARSHALL, *University*:—As I think over the last twenty-five years in pathology, I can think of no more confused chapter than that on which Dr. Jordan has written his interesting paper. As short a time as three or four years ago, I heard an interesting discussion among some very well known pathologists on the question of lymphocytes. The pathological approach to the subject is in some ways a little different from the approach Dr. Jordan can make. If one studies a series of cancers one will find a certain percentage of them heavily infiltrated with these small round cells we call lymphocytes. In certain chronic diseases, particularly tuberculosis and syphilis, the lymphocytes are highly characteristic. The question has been raised, just what role do they play in these chronic inflammations? As I have said, there was absolutely no contribution pathologists could make to this question; they could not agree among themselves as to any useful function, any physiological activity, of the lymphocytes in these conditions. One of them said in conversation (not in writing), that the role of a lymphocyte, so far as he could see, was no more important to the body than that of a camp follower to an army. That was about the most extreme statement.

In regard to Dr. Jordan's paper, I have never heard of a lymphocyte's differentiating along the lines which he has mentioned. The plasma-cell type is very common. Occasionally they will absorb fluid and swell.

The reticulo-endothelial cells are capable of several lines of proliferation. One line of offspring may turn out to be erythrocytes; another line may go through the granulocyte stages of differentiation. Ferrata does not indicate that the lymphocyte itself under these conditions would be the ancestor of the red cell. The parent cell is supposed to be either a reticulum cell or an endothelial cell. By successive processes of mitosis and differentiation of offspring, cells arise progressively nearer and nearer to the erythrocyte in one case, to the granulocyte in the other. I think that the picture described by Ferrata in the lymph node can be seen in leukemia.

The real question raised by Dr. Jordan is this: He describes an object called a lymphocyte. The description is based on size, shape and staining. The important question is, "Are all cells lymphocytes which have the same size, shape and staining as the lymphocytes of the resting lymph node?" For example: If a reticulum cell proliferates and produces offspring eventuating in erythrocytes and if an intermediate stage of cell has the size, shape and staining of lymphocyte, must we, therefore, call this stage in the evolution of an erythrocyte a "lymphocyte?" To me the important question is to establish more precise definition of what is a lymphocyte.

HARELIP AND CLEFT PALATE.*

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Head of the Department of Plastic Surgery of St. Elizabeth's Hospital.

The plastic surgeon has no group of cases in which good results are more important or in which bad results are more conspicuous than in harelip and cleft palate. Upon accuracy, gentleness and careful attention to details depends the ultimate success of operations for the correction of these defects.

Harelip and cleft palate are congenital deformities. The embryonic clefts which enter into the formation of the lip and palate should close by the end of the third month of prenatal life. (Figure 1). According to Davis, in about one out of every twenty-four hundred babies, some part of these clefts remains open, thus causing the various types of harelips and cleft palates. Many theories have been advanced to account for the failure of the clefts to close. There is, however, ample room for speculation on this subject. In about 20 per cent of the cases an hereditary tendency is noted. Nearly always the mother of a baby with harelip or cleft palate will give a definite history of a fall, a fright or of some other ma-

*Read before the fifty-seventh annual meeting of the Medical Society of Virginia, at Norfolk, October 12-15, 1926.

ternal impression to which she attributes the abnormality. The greater number of these occurrences, however, takes place late in the course of the pregancy and can therefore have nothing to do with the deformity.

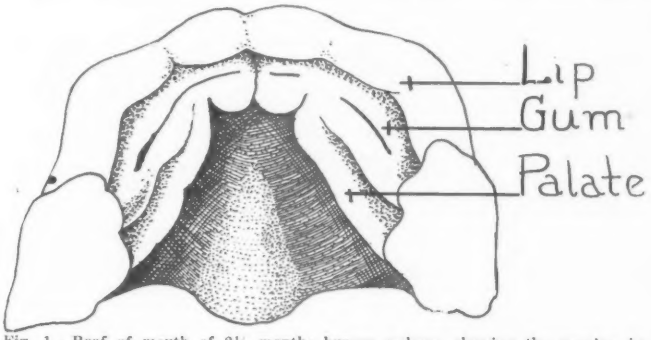

Fig. 1.—Roof of mouth of 2½ months human embryo, showing the opening in the palate. (Redrawn from His).

These abnormalities are not in themselves directly fatal but often are causes of ear, upper and lower respiratory, and gastro-intestinal diseases. If for this reason only, correction of the anomalies should be advocated. Yet, in addition, there is the comfort and appearance of the individual to be considered.

Time for Operation

The time for operation on harelip and cleft palate is an important factor. The deviation from the normal at birth is quite marked, but not as much as it will be later on if the clefts are allowed to remain open or are improperly closed. Therefore, the earlier and the more accurately the cleft is repaired, the better will be the ultimate result. The most desirable time to correct the harelip is within the first few weeks after birth. If there is an associated cleft in the anterior alveolar process, this should be closed before the lip is sutured. Usually the two operations can be done at the same time. Early closure of the lip will improve the appearance of the face, and insure proper facial development and contour.

The most desirable time to operate on the palate is between the ages of six and eighteen months. During this period there is more

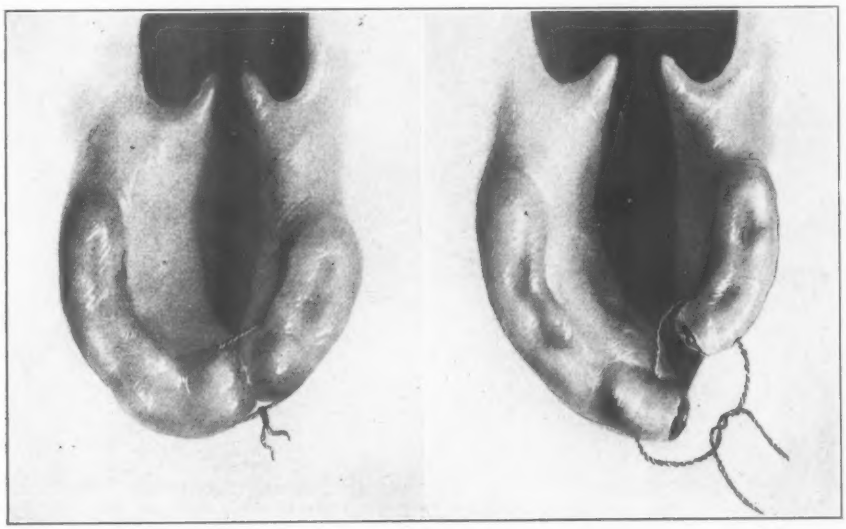

Fig. 2.—First step in correction of complete cleft palate. The adjacent parts of the alveolar processes have been denuded and heavy braided bronze wire passed through the bone on each side of the cleft. This is done before attempt is made to correct the harelip.
Fig. 3.—The braided wire tied, drawing the anterior alveolar processes together.

available tissue for the closure of the cleft than at birth, the palate tissues are better developed, and the shock of the operation is somewhat less. The palate should be closed before the child begins to speak in order to avoid defective articulation. Furthermore, early correction prevents the many complications which frequently accompany an open palate.

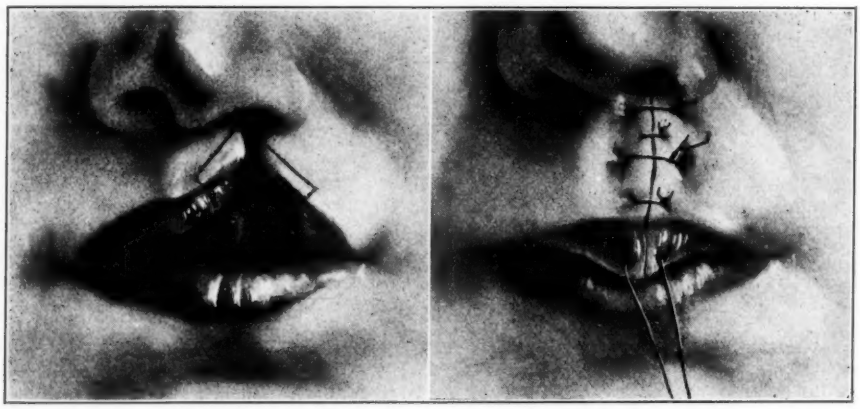

Fig. 4.—Dotted lines show proposed incisions for correction of left single harelip and deformity of the left nostril.
Fig. 5.—Corrected left single harelip and deformity of left nostril, with all the sutures tied except the tractor suture.

Pre- and Post-Operative Care

The details of the pre- and post-operative care are extremely important. No matter how technically perfect the operation may be, if the child is poorly nourished, if he has already a disease of the middle ear or of the upper respiratory tract, or if he is in any other way below normal physically, the operation will usually prove a complete or at least a par-

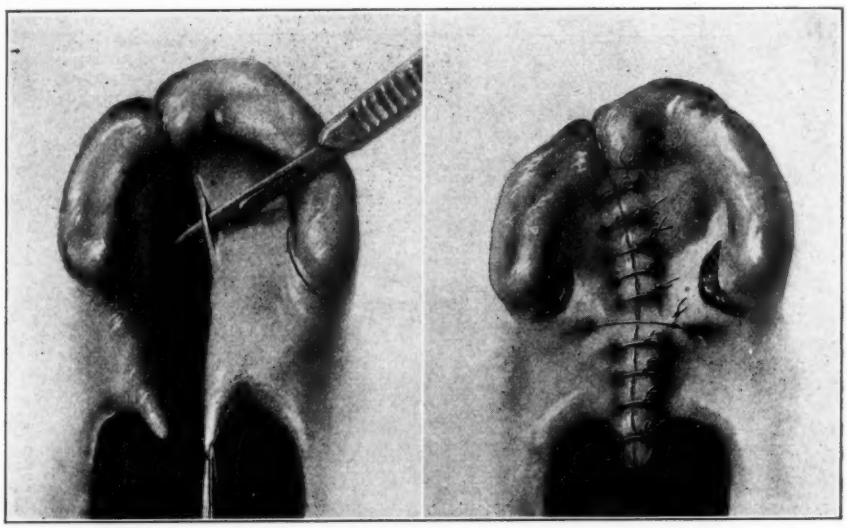

Fig. 6.—Second stage of cleft palate operation. The adjacent sides of the cleft are denuded by stripping off a narrow band of the mucous surfaces. Lines for relaxation incisions are made posteriorly and close to the alveolar processes.
Fig. 7.—All of the silver wire sutures have been tied, completing the closure of the cleft. Note the reinforcing silver wire suture at the junction of the hard and soft palates.

tial failure. Nutrition should be at its best. Rickets, secondary anemia, upper respiratory and middle ear infections are among the most common causes for postponing the operation. Babies who have been fed largely or entirely on condensed milk or preparations containing

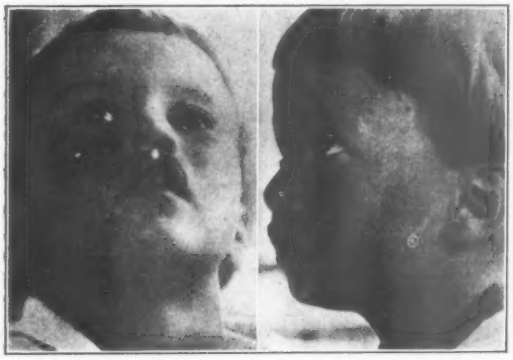

Fig. 8.—Master A. S., age 4 years, on admission. Note complete left harelip with deformity of the left nostril.
Fig. 9.—Profile view of Master A. S. on admission. Note the anterior flare of the right portion of the upper lip.

high carbohydrate content and an improper protein and fat balance may look well, but careful examination will show flabby tissues. These babies do not stand such operations well. In older children, adenoids, tonsils and decayed teeth should be attended to before an operation for cleft palate is done. With babies

Fig. 10.—Master A. S., fifteen days after operation. Note correction of harelip and deformed nostril.
Fig. 11.—Master A. S., fifteen days after operation, profile view. Note absence of tension in upper lip and correction of anterior flare.

it is usually unwise to change markedly the customary feeding formula immediately preceeding or following an operation, as the change in feeding may upset them.

The patient should be in the hospital at least twenty-four hours before an operation for either of these deformities, in order that a thorough examination and preparation may be made. I use 25 per cent neosilvol or argyrol as drops in each nostril every four to six hours. If work is to be done on the palate, the palate is sprayed with warm 2 per cent boric acid solution after each feeding. Only sterile food is given in palate cases. This routine is started upon admission of the patient to the hospital and is continued after the operation until there has been complete healing. After operation, the baby's hands are secured so that the fingers cannot be placed in the mouth. If

Fig. 12.—Baby girl, N. G., 4 months old, on admission. Note single harelip with marked protrusion of pre-maxillary process and deformity of left nostril. She also had a complete cleft palate.

the baby is restless, small doses of paregoric or codeine may be given. Every effort should be made to keep the baby comfortable and to prevent crying. As a routine, the little patient is given six to ten ounces of water containing 1 per cent sodium chloride and 4 per cent glucose as retention enemas several times during the first post-operative twenty-four hours. Sterile water may be given by mouth for the first eight hours and then any strained sterile liquid. The feedings should be given with a baby feeder or teaspoon. Nursing from the breast or a bottle with a nipple should not be

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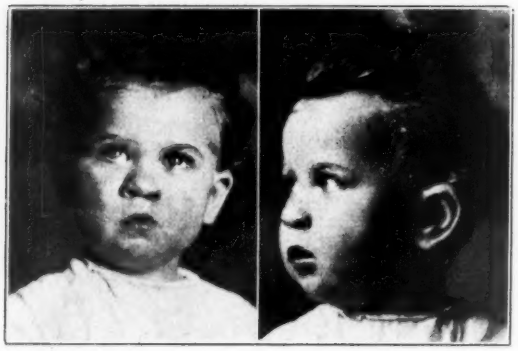
started until two weeks or more after the operation.

Types of Operations

The operation which I perform for harelip is a modification of the Rose operation. Before correction of the harelip it is always important to have a proper background for the lip to rest upon. If the alveolar process is cleft, or if there is a protruding, ununited premaxillary bone, both of these deformities should be corrected first. (Figures 2 and 3). Thorough mobilization of the surrounding tissues is important in all types of plastic procedures and especially in repair of the lip. To secure union without points of tension, the lip and alae of the nose must be dissected free from the maxillary bone. A successful operation for harelip requires: (1) that the muco-cutaneous border of the lip be accurately approximated; (2) that, after suturing, the lip be free from tension; (3) that the mucosa of the lip at the point of suture be slightly over-corrected; (4) that the accompanying deformity of the nostril be corrected. Figures 4 and 5 illustrate the steps in this harelip operation.



Figs. 13 and 14.—Baby N. G. 8 months after first operation in which successful closure of the cleft palate and correction of deformed left nostril and harelip have been done.

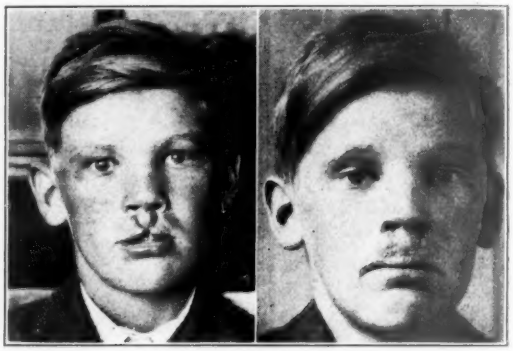


Fig. 15.—Master C. C., 12 years old, on admission, 11 years after attempted operation elsewhere for correction of double harelip and complete cleft palate. Note the notched deformity of upper lip and the over-riding pre-maxillary skin flap.

Fig. 16.—Master C. C., 17 days after plastic correction of upper lip.

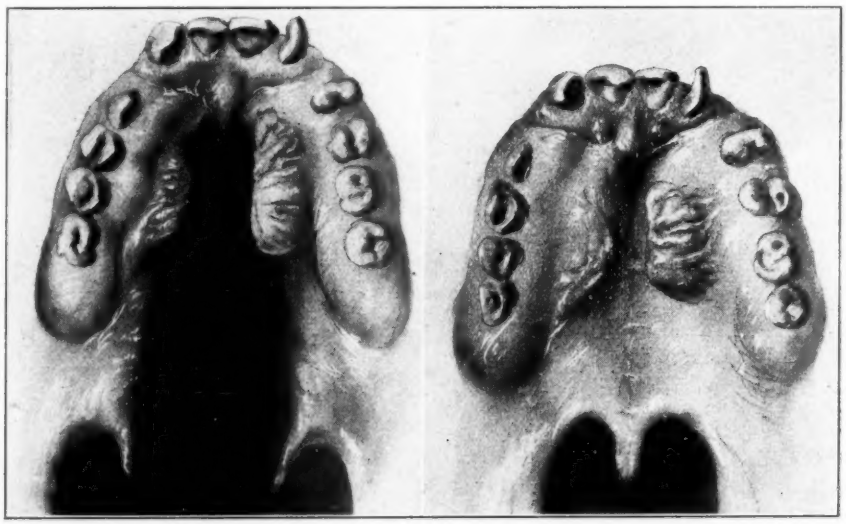


Fig. 17.—Condition of palate of C. C., 11 years after attempted closure elsewhere, in which only the alveolar processes united. Note the wide cleft and the raised areas of scar tissue. The proposed lines for relaxation incisions are shown.

Fig. 18.—Palate of C. C. 3 weeks after operation. No attempt was made at this time to correct the raised areas of scar tissue and the small anterior triangular opening.

My procedure in the repair of cleft palate is based upon the principle of the Lagenbeck operation. The important steps here are: (1) to denude thoroughly the adjacent margins of the cleft; (2) to mobilize freely the muco-periosteal flaps from the hard palate through small relaxation incisions near the posterior part of the alveolar processes; (3) to maintain good nutrition in the flaps; (4) to approximate accurately the denuded margins of the cleft with interrupted fine silver wire sutures, care being taken to avoid undue tension. Figures 6 and 7 show the steps of the cleft palate operation.

Results

From November 1925 to October 1926 I have performed thirty-three consecutive harelip and cleft palate operations without a death or serious post-operative complications. Out of this number, there have been twelve harelip operations and twenty-one cleft palate operations. The results in several of these cases are shown in accompanying illustrations. (Figures 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18).

617 *West Grace Street.*

Discussion

Dr. W. L. Harris, *Norfolk:*—I think Dr. Horsley is to be congratulated upon his clear presentation of this horrible condition. There is no condition in the world which people are more grateful to have relieved. I think mothers, particularly, fail to recognize the importance of the nutrition of the child in this condition. I had a patient come here from Richmond several years ago, and the parents were very indignant because my good friend Horsley, in Richmond, would not operate. I told the mother he was right, that the child was in no condition to be operated upon. She was not satisfied and went to two of the leading surgeons in Norfolk, and they told her the child needed to be built up. She came back to me then and was satisfied to have me treat the child for three months, when I considered it was in condition to be operated upon. Then I got very good results. It is very difficult for a child with this defect to get sufficient nourishment. Most of them are not breast-fed; they are horrible condensed-milk babies. If the mother will insert a small calibre tube and feed the child vigorously by nasal or stomach tube and keep it in the sunlight, it will be in much better condition for operation.

A STUDY OF ACUTE UPPER RESPIRATORY INFECTIONS.

By WYNDHAM B. BLANTON, M. D., Richmond, Va.

A disease which affects 80 per cent of our population on an average of twice a year, against which preventive and curative measures are ridiculously ineffective, deserves repeated investigation and study. Especially is this true when the serious consequences and complications that follow in its wake are recalled. If we thought of our pneumonias, meningitises, brain abscesses, etc., oftener in terms of the usual antecedent upper respiratory infection, we would have more respect for the common cold.

The present study is based upon a review of the recent literature, and upon 800 answers to a questionnaire directed at certain aspects of the "cold problem." This method of investigation has been applied to the same subject by others, notably Townsend, Smiley and Barrow. In this locality we felt that many of the questions could be profitably repeated. Several additional questions have been investigated. Four groups of individuals make up the 800 studied. They were female operators and nurses (429), medical students (312), inmates of an old ladies' home (38), and children under eight (21).

The Frequency and Importance of Colds

Of the whole group reported, 80 per cent have had acute upper respiratory infections during the last twelve months. Among 403 female operators, 287 were affected (70 per cent.) Among 312 medical students, there were 298 involved (95 per cent). This 25 per cent higher incidence of "colds" in males may have an explanation in the more frequent use of overshoes and umbrellas by the females, as referred to later. The fact remains, that males are usually more exposed, and the greater incidence of "colds" among them is brought out in a comparison of men and women at Harvard and Stanford by Barrow.

The whole group averaged 1.7 "colds" during the last twelve months, and 2.4 for the previous years. The latter figure is more apt to be exaggerated. Again, it is noted that the males have more colds a year than the females—2 as opposed to 1.34. The low incidence among the aged (1.2), and the frequency of colds among children (3.6) is apparent, being about three times as great among the latter. These figures agree well with those of Townsend, who, among 1,272 individuals, found a rate of 1.9 "colds" per person—a morbidity of 1900 "colds" per 1000 population. Barrow's figures are still higher. Stanford men, 2.84; Stanford women, 2.09; Harvard men, 2.88. The repeated occurrence of "colds"

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TABLE I

INCIDENCE OF COLDS IN THE WHOLE GROUP DURING THE LAST TWELVE MONTHS.

	Female Operators	Nurses	Aged Women	Children	Medical Students	Total
Total answers received	403	26	38	21	312	800
Number having colds	287	19	26	21	298	645
Percentage of colds	70	73	68	100	95	80

in the same season in the same individual is supposed to express a poor or short lived immunity. Cecil states that the immunity to a "cold" lasts from six to eight weeks. We have only recently encountered, however, an individual who experienced three colds in six weeks. The first was in the late summer and followed chilling of the body. The second was a sequence of the same character, and aborted in 24 hours. The third was a severe "cold" contracted during a house infection in which six or seven persons were involved. The explanation is simple and brings us to a reasonable classification of colds:

First, those which are not particularly contagious—"non-contagious" (Cecil), and which are probably due to organisms normally parasitic and docile inhabitants of our upper respiratory tract, acquiring invasive characteristics in the presence of a lowered resistance, usually from fatigue, chilling or other factors that lessen immunity. Second, those very contagious respiratory infections that depend upon the virulence of the causative organisms. A carrier or an unisolated acute coryza in the usual contacts of the winter months infects family after family. Increased virulence comes with repeated animal passage and "colds" sweep through whole families unabated.

For the whole group the average duration of these infections was 6.8 days, and the days lost from work were .6 for the year. 403 operators lost 177 days or .4 days per person. 312 medical students lost 280 days, or .9 days per person.

A graph plotted to show the monthly incidence of acute coryza in this locality displays two characteristic peaks, an especially high one in September and another during the months of January and February. Each subgroup separately plotted shows the same type of curve. Townsend produced similar graphs for other widely distributed localities (Boston, Washington, Chicago, New Orleans, San Francisco). He showed that in spite of the difference in climate there was a remarkably "synchronous behavior of the incidence of respiratory affections in all of the localities." Our curve conforms in the main with his except for the fact that last year September rather than October showed the higher incidence of "colds." It may or may not be of comfort to the sufferer to know that, while he endures "colds" in Virginia, the citizens of California and Massachusetts are equally subject to the same seasonal incidence.

TABLE II

AVERAGE YEARLY NUMBER OF COLDS REPORTED PER PERSON

	Female Operators	Nurses	Aged Women	Children	Medical Students	Total
For last 12 months	1.34	1.8	1.2	3.6	2.0	1.7
Previous years	2.2	2.2	--	--	2.5	2.4

Causative Factors: To the question, "To what do you attribute your 'colds,'" there were naturally many different answers, but a fairly simple grouping of them is possible. The great majority (705) considered changes of temperature responsible for their illness. Under this heading is grouped wet feet and clothes (146), drafts, natural and artificial (131), changes of atmospheric temperature (134), cold rooms, over-heated rooms, insufficient clothing, etc. A surprisingly few persons considered contact causative (36.) Only twelve mentioned poor ventilation. There is apparently little appreciation in this group of the factor of contagion. One catches "his

death of cold," not from another infected person, but through exposure of the body or other insults. If this be a true cross section of the public understanding of the origin of "colds," then there is need for dissemination of knowledge about the contagiousness of coryza and other respiratory infections. We need to know that handkerchiefs contaminate pockets and pockets in turn contaminate clean handkerchiefs and so we may constantly reinfect ourselves, and that the nursery handkerchief should be taboo.

TABLE III

THE CAUSES OF COLDS TABULATED FROM THE QUESTIONNAIRE.

	Medical Students	Operators	Nurses	Total	
Temperature				705	
Wet				146	
Feet	16	56	2		74
Clothes	25	47			72
Over-heating	77	6	2	85	
Cold room	4	12	2	18	
Lack of clothes	17	38	4	59	
Change of clothes	4	13		17	
Change of weather	89	42	3	134	
Drafts				131	
Natural	28	72	3		103
Artificial	2	26			28
Exposure	79	30	6	115	
Poor ventilation	6	6		12	
Contact	32	27	1	60	
Low resistance	25	1		26	
Susceptibility	7	3		10	
Stomach and bowels	9	1		10	
Bad throat—					
Tonsils, sinuses	3	4	2	9	
Dust	9			9	

The value of sterilization by boiling of the eating utensils of a person suffering from a cold has been repeatedly shown in camps and is applicable to household preventive medicine. We need more publicity about droplet infection, ventilation, and the high incidence of virulent bacteria recovered from agar plates exposed for only a few minutes to the air of a crowded room. The common towel, unwashed hands, the promiscuous cougher, the heedless sneezer, and the treacherous kiss of the acute coryza need to be held up for public condemnation. Isolation of those with colds is possible, though troublesome.

Smiley believed that a study of all the factors calculated to lower resistance might throw some light on the subject. He accordingly sought in his questionnaire for the influence on "colds" of such things as tobacco, dust, gas, mouth breathing, drafts, constipation, bathing, footwear and the removal of tonsils. He concluded that none of these were major factors in lowering resistance. He found that woolen clothes were no panacea, as there were almost twice as many "colds" among the wearers of woolens as among those preferring lighter underclothes.

In answering our question, "Do you wear over-shoes or carry umbrellas?", four times as many over-shoes were reported worn by women as by men, and the female users of umbrellas were twenty times as numerous. As this is an outstanding difference in the habits of the two sexes, it would be interesting to know how much relation it bears to the recognized greater incidence of "colds" among men.

Barrow investigated the relation of the method of house heating to the occurrence of "colds" among the Stanford students without noting any great influence of one system over another. There was, however, a slightly lower susceptibility among users of wood and coal stoves. Of our total group, 694 answered the question on heating. Furnace heated houses numbered 402, stove heated 292. Eighty-three per cent of those living in furnace heated houses suffered from colds last year, while 76 per cent was the incidence among those whose homes were heated by stoves.

Complications: Ear involvement as a com-

TABLE IV

SHOWING THE RELATION OF HOUSE HEATING TO THE INCIDENCE OF COLDS.

	Furnaces			Stoves		
	Colds	No Colds	Per Cent	Colds	No Colds	Per Cent
Operators	98	51	----	182	66	----
Medical Students	226	12	----	35	1	----
Nurses	13	2	----	7	1	----
Total	337	65	83	224	68	76

plication of these infections in adults is not considerable in this group. There were eleven (11) cases. Sinus infection was much more frequent. Eighty-four cases were reported (11 per cent). Many excellent observers now believe that every coryza is accompanied by an infection of the paranasal sinuses. There is abundant autopsy and clinical evidence to substantiate this, and the intimate relation of the mucous membrane of the nose and these sinuses make the reason apparent. The routine use of suction and nasal shrinkage in the treatment of the coryzas is therefore indicated. It is stated that 75 per cent of all pneumonias begin in a "cold." Of the persons interrogated in this questionnaire, 27 stated that their "colds" had at one time or another developed into pneumonia.

TABLE V.

INCIDENCE OF EAR, SINUS AND PULMONARY COMPLICATIONS.

	Operators	Medical Students	Nurses	Total
Total No.	403	312	26	741
Ears	5	5	1	11
Sinuses	55	24	5	84
Pneumonia	11	16	----------	27

Prophylaxis: The problem is identical with that of any contagious disease. The first concern is with the infecting organism. Against virulent organisms the public should be protected by the means indicated above. If isolation is not enforced, prevalent bacteria should be rendered as relatively harmless as possible by ventilation, proper habits of coughing, sneezing, sputum disposal, hand washing, etc.

On the other side of the question is individual immunity. Vaccination, so successful in typhoid and other exotoxic diseases has naturally been tried repeatedly in the respiratory diseases. The reports of investigators is widely different. There is considerable evidence that a mixed prophylactic vaccine of the common upper respiratory organisms affects favorably the incidence of pneumonia. Cecil demonstrated it on a large group at Camp Upton. The occurrence of 173 cases of pneumonia in 19,481 unvaccinated as against 17 cases in 12,519 soldiers who were previously inoculated has great significance. Park and his co-workers in an investigation of the value of stock vaccines on New York Life Insurance Company employees also were impressed by the lowered incidence of pneumonia in the vaccinated. On the contrary, among a small group of my own, two out of one hundred inoculated developed pneumonia within the year. Is this experience applicable to anticold vaccination? One fact has to be borne in mind. We do not know what organism is the primary invader in "colds." Do the common mouth bacteria with which we are familiar (streptococci, staphylococci, pneumococci, influenza bacilli, etc.) play the whole role, or is there an unidentified germ, an anaerobe or filterable virus, which strikes the initial blow and prepares the field for the secondary invaders

with which we are acquainted? Foster and Olitsky claim to have conveyed colds by swabbing the pharynx of normal persons with material from the pharynx of acute coryza after first passing it through Berkfeld filters. This is certainly a likely theory in epidemic influenza, and it has its advocates as an explanation of some of the phenomena of colds. Valentine and Mishulow, in a cultural and serological study of streptococci from the inflamed mucous membrane of the upper respiratory tract, declared that there were so many groups and sub-groups serologically dissimilar that it was impossible to decide upon a dominant strain. They were of the belief that the strains isolated by them were not of primary etiological importance. With this possibility in view, it is easy to understand the weak point of vaccination against "colds." If a virus is the primary invader, our mixed vaccines are composed of bacteria entirely of secondary importance, and vaccination at best protects us only against the complications of "colds," sinuses, ears, pneumonia. It may do more. It may shorten or make milder the prolonged "cold" which in its later stage may be a disease of secondary invaders. So much for theory.

What are the facts about anti-cold vaccination? Von Sholley and Park reported the results of vaccination on 1,536 persons, and concluded that it was without value. McSweeney reported 1000 telephone employees vaccinated, two-thirds of whom later claimed to have been helped. Freudenthal maintains that it is effective against the so-called infectious "colds", but not against "colds" of exposure. Of the 800 persons interrogated by us on this point, there were 53 who had received the vaccine. Twenty-five (47 per cent) claimed to have been helped. Twenty-eight were not benefited. On the contrary, of 41 office patients, 30 (73 per cent) note from slight to great improvement (stock vaccine). Of the 94 combined cases, vaccination proved helpful in 57 per cent. The users of the properly prepared autogenous vaccine claim much better results. There are certain insurmountable difficulties in the routine use of autogenous strains. The expense and time element often put them out of the question. I have no doubt whatever that far better results are obtained with them employed at weekly intervals throughout the whole fall and winter season.

However varied prevalent ideas are about cold therapy, to neglect the active treatment of all "colds" is hazardous. The claim is made that "colds" may be diagnosed and cured before the onset of symptoms by the objective appearance of the mucous membranes of the eyes, nose and throat, and Dennett advocates the early instillation of silver salts into the conjunctivae as an effective way to sterilize the whole upper respiratory tract. There is little question about the effectiveness of rest in bed, warmth, fluids and alkalies in restoring and augmenting immunity. Shrinkage of the nasal mucous membrane and suction effectively promote drainage of the paranasal sinuses which seem to play a role in every cold. Local applications of silver, mercurochrome, and other so-called bactericidal agents are, of course, time honored procedures. There are, however, grave objections to swabbing and spraying. One wonders often if the injury to bacteria by these agents is not exceeded by the injury to tissue. Upon the same principle chlorine gas is advocated. Vedder and Sawyer reported in 1924 experiments, which, if confirmed, bid fair to revolutionize the whole treatment. They showed that the throat could be practically sterilized by inhalations of chlorine gas in concentrations of .02 mgm. per litre, and that in a closed chamber various respiratory infections could be effectively dealt with by using a concentration of .015 mgm. per litre. Of 931 "colds" so treated, 71.4 per cent

TABLE VI.

EFFECT OF PROPHYLACTIC VACCINATION FOR COLDS.

Number vaccinated	Helped	Not Helped	Percentage Helped
53 (questionnaire)	25	28	47
41 (office patients)	30	11	73
94 (total)	55	39	57

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were cured and 23.4 per cent improved. Feldstein claimed to have cured or improved 89 per cent of 2,640 coryzas treated by him. These claims are significantly unconfirmed in the recent literature. There has been peculiar silence about the so-called chlorine treatment. Cecil writes me: "It is expensive and impractical, and the results are in no way commensurate with the objections to its use." Of 800 persons to whom our questionnaire went, only 7 had taken the treatment. Only two of these thought they had gotten any results.

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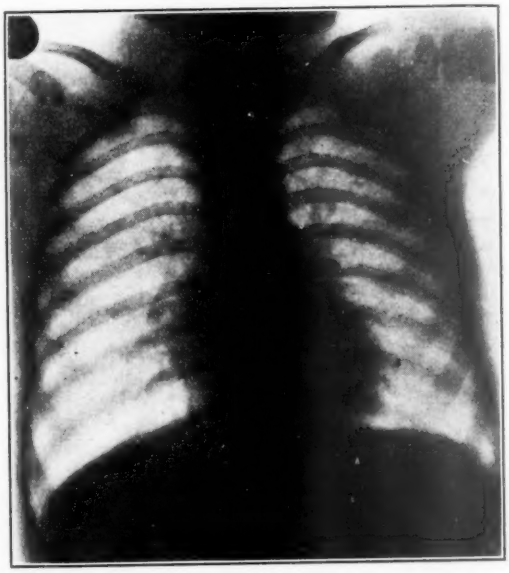
300 *West Grace Street.*

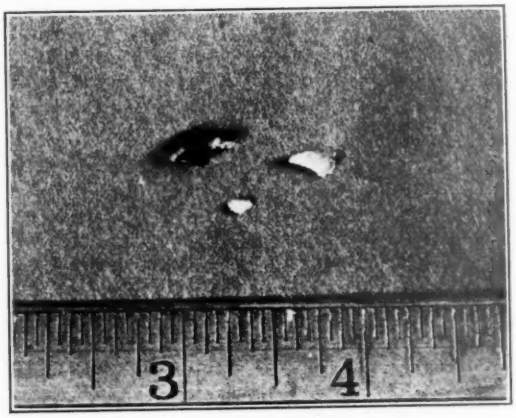
GRAIN OF CORN IN RIGHT MAIN BRONCHUS: REMOVAL BY USE OF BRONCHOSCOPE.

By E. G. GILL, M. D., Roanoke, Va.

Patient, age four, was admitted to the hospital, January 4, 1927, and gave the following history: December 31, 1926, child while eating parched corn suddenly strangled and coughed. Has had coughing spells at intervals since and has a wheezy sound all of



the time. Child has not had any particular difficulty in breathing and feels well. Temperature on admission was normal. Physical examination of chest was negative except for marked wheezing sound which was constant.



Blood count W. B. C. 11,600. Haemoglobin 65 per cent. Polynuclears 62 per cent. Lymphocytes, large 1 and small 37. X-ray examination of the chest did not reveal a foreign body or any pathological condition in either lung.

In view of the history which was so strongly

suggestive of foreign body aspiration, we decided to pass the bronchoscope. There was considerable amount of mucus in the trachea and bronchus. After this was removed, the grain of corn was readily seen in the right main bronchus and removed. Time of the operation was eight minutes. There was no post-operative reaction and the child left the hospital at the end of the second day. The wheezing breathing which was so marked on admission disappeared immediately following the operation.

Before passing the bronchoscope, we removed a number of grains of corn from the bronchus of the dog. The technique was quite similar to the one employed at the time of the operation.

Gill Memorial Eye, Ear and Throat Hospital,
Department of Bronchoscopy.

WHAT'S IT ALL ABOUT?*

By WRIGHT CLARKSON, M. D., Petersburg, Va.

Sometimes at night I go up on the housetop. There well above most of the surrounding city, I ponder and think and wonder "What's it all about?"

When fortunate enough to find the moon beams on the roof, the pleasure of my visit is greatly augmented, but, you know, I rarely think of what the weather or planetary setting is until I arrive, for, like most folks, my life is chiefly filled with the task of making a living.

Among other things, I wonder why such a great amount of one's time must be so spent. As physicians, we see many cases to which we would like to devote days of study, but few of us have enough time to spend on any one subject to become well acquainted with it.

Where lies the fault? Is it because the wage usually paid for our work is insufficient? Well, I don't think so. The case to which we wish to devote a month may not have one dime to pay us, but we usually have a few others to help along.

Why then has the Creator so destined our lives? Perhaps it's because it is necessary for most people to be kept very busy in order for them to keep out of devilment; but think of how much time we waste in our daily efforts. Why does one man accomplish so much more than another with apparently the same time and talents? Often it is a lack of judgment. I have in mind a certain prominent physician in our community who just yesterday left his office full of patients to go twenty miles to see about bringing home an old Ford in which he had met with an accident the night before. Any laborer could have done this, and for less wage than he could have demanded from his patients during the same time.

After all, it takes a busy man to accomplish things. The more routine work we have to do, the better trained we become in accomplishment, and after awhile we can do thrice the work and find ample time for scientific study and even recreation—an element that most physicans begin to think of after it is too late.

There is a cause for our existence. This great universe, in which the average individual is as a grain of sand in the great Sahara, will go on without you, but God must have some purpose for all of it. Surely, no sane man could deny the existence of a Supreme Being, no matter what his religion may be, and the more we consider the religion of others the more we realize that there is no certainty that any one is right. About the fundamentals, however, all sane human beings must think alike. There is some Divine Power. Man is not supreme. No matter what powers we may possess, we lie down and die without exception, and the marvels of nature continue without us.

What's it all about? Surely, no man can look up into the heavens really cognizant of even the elementary principles of the planets and not realize the existence of a God. Or, if there were no heavens, who could study the wonders of nature as revealed on earth and not believe? Believe what? At least that these things are being run by no power of our own, and their very existence and precision of repetition teach us that it is all a part of the eternal plan of some Supreme Being. To this Power I pray, believing it to be the Divine Jehovah, as we know Him, but never-the-less to that Supreme Power, whatever it may be, that rules the universe and has honored me with a chance to become a part of the "plan that is to work to the final good of man."

What man is there among us who does not wish to be great? None! At least I hope not! Surely, we all hope to be greater some day than we are at present. That is the enthusiasm in us, and when enthusiasm is dead, God help us!

Then why not be what we want to be?

*President's address delivered before the Third Annual Meeting of the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., October 5, 1926.

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Hard luck may play its part, but we all love the man that in spite of many disappointments always bobs up on top. Really, it isn't hard luck so much as it is procrastination and the influence of environment. As with the rising sun of each day there comes new hope, let us see in the whole year that is before us, until we meet again, the enthusiasm of greater accomplishment.

What will insure this? There are many things, but chiefly ABSTINENCE and ENTHUSIASM.

Abstinence is self-denial, a victory over evil indulgence and the power of defending that divine right every human being has to a successful career.

"Abstinence is self-defense."

Enthusiasm, representing vision, ambition and courage, is a picture of a goal to conquer with the necessary inspiration and determination to succeed.

Enthusiasm is Power!

It is forcibly illustrated in the following words of Brisbane:

> "Enthusiasm is the force that drives us.
> "At one end of the long road is the cradle, where we get our start and our teeth. At the other end that vague temple called Success—and just beyond it the grave, where, without teeth, we lie down and are forgotten.
> "Why we start, why we climb, what the power that drives us towards the shining temple, we do not know.
> "All except perhaps one in a million fail, grow tired, sit down to rest like the man in the picture.
> "Then hope flies away, and that is the death of enthusiasm."

So in closing, my wish to you is that the spirit of abstinence and of enthusiasm may be with you during the coming year. May you accomplish great things, do the things you really want to do and thereby meet with success.

CONGENITAL TORTICOLLIS.*

By PAUL C. COLONNA, M. D., New York, N. Y.

Torticollis or wry-neck is a distortion resulting from a contraction or shortening of one or more of the lateral muscles of the neck, usually the sternomastoid. Alexander the Great is said to have suffered from this deformity. The acquired form which is the more common and infectious in origin, we are not concerned with in this paper. Of the congenital or fixed type of torticollis, 269 cases were recorded from the total number of 55,000 new orthopedic cases seen at the Hospital for the Ruptured and Crippled, New York, in the six year period from 1920 to 1926. Of this number there were 122 females and 147 males, a slight preponderance of males. Only 88, or about one-third of the total number seen in the clinic, were admitted for operation, and the histories of 51 of these cases have been studied and reviewed for this paper. Of this review there were 24 females and 27 males, 24 involving the left side of the neck and 27 the right side.

The etiology in all cases cannot definitely be settled but the majority fall within one of two origins: (1) a primary congenital deformity due to some defect of the embryo—as cervical rib, an abnormal number of lumbar vertebrae, synostosis of atlas and axis, etc. This type is far less frequently seen, however, than those due to the so-called secondary congenital deformities, under which are classed those deformities resulting from a faulty intrauterine position. This mechanical theory seems the most plausible explanation to account also for most cases of club feet, clubbed hands and dislocated hips. Under this origin would also be placed those cases of torticollis thought to be due to an ischemia as a result of occluding the sternomastoid branch of the superior thyroid artery which supplies the sternomastoid muscle.

The theory that Stromyer propounded many years ago seems definitely disproved. He thought that congenital torticollis was usually caused by a rupture of the sternomastoid muscle-fibres by trauma, followed by a subsequent myositis developing in the hematoma, causing muscle contracture. As Whitman points in his text-book the rupture of muscles elsewhere is practically never followed by myositis with contracture, unless as demonstrated by Heller, an actual infection follows the muscle injury. In 22 of the cases it was found that 13 or about 60 per cent were recorded as having a difficult labor, but whether this was the cause of the subsequent wry-neck or the effect of the existing torticollis *in utero* would be difficult to say. In this series of 51 cases the wry-neck condition was noted at birth in 14 cases but in only one was the birth in any way unusual, this one case being a breech presentation. This agrees with the majority

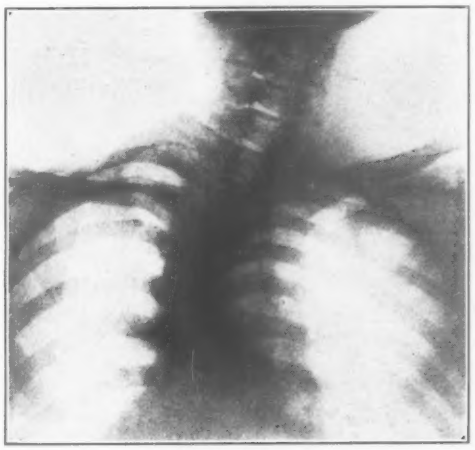
*Read before the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., at the Third Annual Meeting, October 5, 1926.

of observers, and therefore it seems likely that while hematoma may be a complication in congenital torticollis it can hardly be regarded as its cause, but rather the effect of a difficult labor from a faulty position *in utero*. The congenital type may be defined as a painless shortening of the neck muscles of intrauterine origin. Another point of interest in the study of these cases was the age when the deformity was noticed. In 42 cases the average age the child attained before the deformity was noticed, according to the statement of the mother, was between 11 and 12 months. This extremely high average is because several cases were reported as first noticed when about five years of age, but it seems inconceivable, in spite of the mother's statements, to believe such a deformity would pass unnoticed for this length of time. Disregarding these few cases the average is reduced to 3 months. The absence of a difficult labor in the majority of congenital torticollis cases as well as the short neck of an infant doubtless explains why the existing torticollis remained unnoticed for a few months after birth.

A case of bilateral congenital torticollis, showing the prominent sternomastoid muscles and the fixed attitude of the head in slight flexion. These bilateral types are extremely rare.

From the pathological standpoint there is found on examination of the sternomastoid muscle a sclerotic interstitial myositis which produces a dense induration and shortening of the muscle.

A child presenting its head inclined to one side, the chin twisted toward the opposite shoulder and the contracted muscle prominent, having in many instances a slight asymmetry of the face and a moderate scoliosis in the cervical region, presents a characteristic pic-



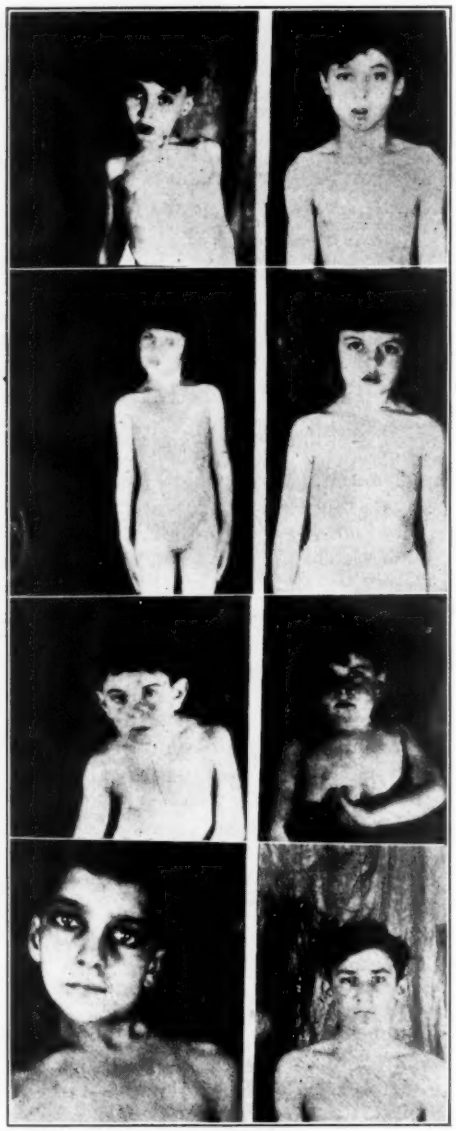
Showing the marked scoliosis which develops in untreated cases of torticollis.

ture of unilateral congenital torticollis. Bilateral contracture of the sternomastoid is very rare, producing great limitation of the movements of the head, and a characteristic fixed attitude.

The diagnosis in older cases is self-evident but in infants sometimes acute infections of cervical nodes, reflex irritations from otitis media, and cervical Pott's disease may cause confusion. Especially in the latter condition is it difficult at times to differentiate. A valuable point to remember is that in cervical Pott's disease in addition to the head movements being painful the chin is usually pointed toward the prominent sternomastoid muscle, while in congenital wry-neck the opposite is true. A positive X-ray in Pott's disease of an infant of course means much, but a negative one does not rule out tuberculous disease in the cervical region.

In very young infants a methodical stretching of the contracted tissues is usually all that is required to correct the deformity but cases over six months are rarely cured without an operation. Of the 269 new cases seen from 1920 to 1926, there were 140 or about two-thirds which were satisfactorily treated by methodical passive manipulation but in the

more resistant cases a tenotomy of the contracted parts had to be employed. The average age of operation in this series of 51 cases was 9 years, which doubtless accounts for the high percentage presenting facial asymmetry and cervical scoliosis, 80 per cent showing some degree of these sequelae.



Photographs on left illustrate typical attitude of the head with the accompanying facial asymmetry in congential wry-neck, and on the right are photographs of the same cases from one to three years after operation.

A subcutaneous tenotomy of the contracted tissues was formerly employed but the method is both dangerous and unsatisfactory. A careful dissection and tenotomy of the contracted bands through a two inch incision made just below and parallel to the clavicle is a most simple and satisfactory procedure. Some surgeons advise a more radical method, removing a section of the contracted sternomastoid at its mid-portion. Lange and Putti believe the approach at the origin of the muscle is preferable, in order that the scar may later be obliterated by the growth of hair on the scalp. Whatever the mode of tenotomy employed, it is essential to divide as far as possible all the limiting bands of muscle and fascial sheaths and to hold the head in the over-corrected position from four to six weeks. The simplest method is to employ plaster-of-Paris to hold the head in the desired attitude, which would be just the reverse of the wry-neck deformity and to employ daily massage and stretching of the neck muscles on removing the plaster.

From a summary of these cases we may conclude: (1) That congenital torticollis is a rather rare deformity—being seen in about one-half of one per cent of all orthopedic conditions. It is more common in males. Bilateral cases are extremely rare, the right side being the more frequently affected. (2) The majority of cases gave a history of normal birth. In those cases where labor was difficult and followed by hematoma formation, it was probably due to a faulty position *in utero* and was the effect rather than cause of the wry-neck. (3) The majority of cases remain unnoticed during the first few months after birth, the average age when noticed being about three months. (4) In older cases the development of facial asymmetry and cervical scoliosis is the rule. (5) The treatment in young infants consists of methodical passive stretching of the contracted tissues; in older cases an open tenotomy with plaster-of-Paris to hold the head in the over-corrected positon is the proper treatment.

59 *East 54th Street.*

DIET IN TREATMENT OF PERNICIOUS ANEMIA.*

By ESTILL L. CAUDILL, M. D., Narrows, Va.

Anemia may be defined as a reduction in the amount of the circulating oxygen-carrying

*Read before the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., at the Third Annual Meeting, October 5, 1926.

constituent, called hemoglobin. A reduction of circulating hemoglobin is, in most instances, associated with a reduction of the cells which convey hemoglobin, namely, the red blood cells.

Pernicious anemia is an anemia of unknown origin which progresses, usually with remissions, to a fatal issue. The malady is by no means rare. The question of its causation is apparently far from solution, despite the multiplicity of theories that have been advanced. A distinguished clinician has described the results of treatment as ever more disheartening.

Heredity, infection, intestinal atrophy, defective absorption of nutriment, improper assimilation—these and other alleged causes of pernicious anemia have had a hearing and been for the most part abandoned as inadequate to explain all known facts. The Danish clinician Faber, in an address before the American Congress of Internal Medicine at Detroit last year reverted to the view that pernicious anemia has its origin in intestinal intoxication. Pointing to the association of this disease with achylia gastrica, he argued that this condition gives rise to various possibilities for the formation and absorption of hemolytic substances in the bowel, because of the transformation of the normal intestinal flora through lack of the usual gastric germicidal processes. Either the bacteria themselves or their toxins may consequently be taken into the blood stream. In other words, achylia gastrica distinctly favors intestinal intoxication processes. To this view is added the suggested possibility that with protracted hemolysis from any cause the hematogenic organs give out. Wells has ventured the further suggestion that their exhaustion may perhaps be hastened by the influence of the toxic substances in the blood, hematogenesis then becoming insufficient to replace the lost corpuscles.

In this paper I wish to call attention to the special diet recommended by Minot and Murphy, of Boston, and published in the *Journal of the American Medical Association*, August 14, 1926.

The most important recent work concerning the effect of food on blood regeneration has been done by Whipple and Robscheit-Robbins and their associates. Their carefully controlled work on dogs has demonstrated clearly the value of certain foods, especially liver, to accelerate blood regeneration following acute hemorrhage, and the value of iron added to the diet to decrease the anemia due to chronic blood loss. McCollum has pointed out that liver and kidneys give an exceptionally high quality protein for a low protein intake and can enhance remarkably, the growth of animals.

Various investigators have commented on the blood destroying properties of certain substances derived from fats and the role they play in pernicious anemia. Excess of fat in a diet is considered by some to favor putrefaction within the intestine, a condition frequent in pernicious anemia. One might attribute any benefit derived from a low fat content of the diet to alteration in the bacterial flora rather than to some more direct effect on blood formation or destruction.

Leafy vegetables and fruits usually are considered desirable for anemic patients, especially because of their iron content. Strawberries, rich in iron, appear beneficial to patients suffering with sprue, a disease very much resembling pernicious anemia. These foods are added to the diet, because they have especially favorable influence on hemoglobin production.

The special diet, which we have used on two cases, is as follows:

One-fourth to one pound of fresh liver, daily, broiled, or boiled, not cooked too done.

An equal amount of kidneys is occasionally used.

Beef and mutton muscle meat is used in from one-fourth to one-half pound daily.

Vegetables, low in carbohydrates, from ten to sixteen ounces daily.

Fruits, especially peaches, strawberries, oranges and grape fruits, are used.

Fats in form of butter and cream are allowed only in small amounts to make the food palatable.

An egg and some milk are permissible.

Breads, especially dry and crusty, cereals and vegetables are allowed in order to make a total intake between two and three thousand calories.

Concentrated sweets and sugar are allowed very sparingly.

This diet is rich in protein and low in fat.

I wish to report the following case:

Mrs. S., housewife, age 45 years, first entered the hospital on April 14, 1926, complaining of increasing weakness. She is unable to walk without assistance, complains of nocturnal headache which is severe; she is very nervous, has constant ringing in ears which is

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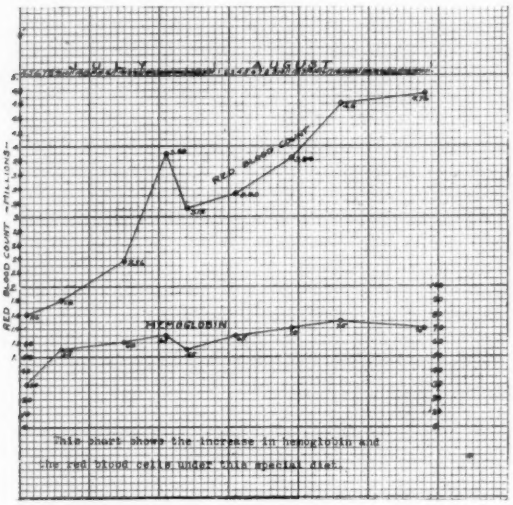
very annoying, numbness of fingers and sometimes of lower extremities; color resembles very much that of grape fruit; conjunctiva markedly jaundiced. Her red blood count was 1,960,000, and the blood was typical of pernicious anemia.


APRIL
RED BLOOD COUNT
HEMOGLOBIN
This chart shows the increase in hemoglobin and the red blood cells under this special diet.

She was given four direct transfusions of from 300 c.c. to 750 c.c. between April 4th and May 10th. Her red blood count on May 10th was 2,160,000. Her general condition was improved, jaundice had cleared up, and ringing in ears was better.

She re-entered the hospital on July 4th, with the same symptoms as at previous admittance, except that her condition was gradually growing worse. Her red blood count was now 1,600,000 and hemoglobin 30 per cent. She was given large doses of hydrochloric acid and started on diet as before mentioned.

The chart will show the blood picture following this treatment.

The patient at present is in a remission. Her condition is much improved. She is doing her own housework and says she is feeling fine.

RADIOLOGICAL STUDIES OF THE GALL-BLADDER.*

By R. G. WATERHOUSE, M. D., Kinston, N. C.
Fellow in Surgery, Cleveland Clinic, Cleveland, Ohio.

The gall-bladder has long demanded the attention of the surgeon and internist from the standpoint both of treatment and of diagnosis. The liver is not only the largest organ of the body but performs at least five very definite and vital functions one of which is directly dependent upon a properly functioning biliary tract. An improperly functioning or diseased biliary tract is the most common cause of disease and impairment of the liver.

These statements are so familiar as to seem trite. Yet, though we do see text-book pictures of catarrhal jaundice, of biliary colic, of cholecystitis, there is no definite symptom complex, no dependable clinical or laboratory sign or method, which will definitely condemn or exonerate a suspected gall-bladder, to say nothing of giving a definite differential diagnosis between the affections of the upper right quadrant such, for example, as are responsible for the so-called indigestions.

From the surgical standpoint diseases of the gall-bladder are often treated too late. The disease which at first may have been local in the gall-bladder or at least remediable by removal of the focus in the gall-bladder has progressed, giving rise to a cholangitis, hepatitis, pancreatitis, or adhesions, conditions in themselves capable of continuing the patient's symptoms.

The best radiologists are constantly seeking by all methods at their command to bring positive evidence to bear on just such cases.

Since the introduction by Graham of the so-called "Dye visualization of the gall-bladder," the attention of radiologists has been focused on the gall-bladder.

It is the purpose of this paper to show what we may expect from the X-ray department in diagnosing gall-bladder pathology.

Indirect Evidence of Gall-Bladder Pathology

In doing the usual barium meal examination the radiologist may observe an unnatural fixation of the pylorus or duodenum or an abnormal position of these structures, which to him is evidence of trouble in the area of the gall-bladder. Adhesions in this region in the absence of ulcer are usually due to the gall-bladder. Occasionally on the stomach plate a pressure defect of the duodenal cap will be seen. This is usually attributed to the gall-bladder, but may be due to other structures as, for example, a lobe of the liver. By filling the gall-bladder with dye and repeating the stomach plate this point can be determined.

*Read at the Third Annual Meeting of the Ex-Interns' Association of St. Elizabeth's Hospital, Richmond, Va., October, 5, 1926.

Gall-Stones

Gall-stones are classified chemically by Aschoff and Bacmeister as:

1. Pure cholesterin stones.
2. Stratified cholesterin-calcium stones.

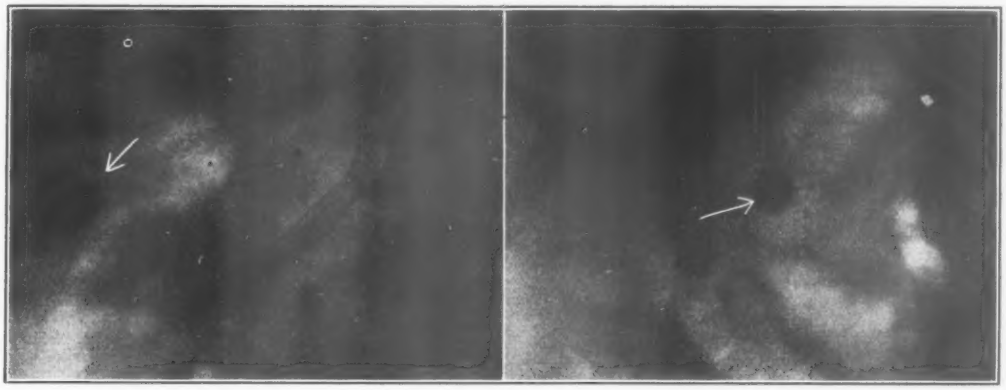


Fig. I. A. Shadow of gall-stone in anterior-posterior film. B. Shadow of same stone in posterior-anterior film.

3. Cholesterin-pigment-calcium stones.
4. Composite stones, composed of cholesterin and a mantle of cholesterin and calcium.
5. Bilirubin-calcium stones usually found in the bile passages of the liver.
6. The very rare calcium carbonate stones.

Cholesterin stones are of about the density of the surrounding tissues and usually do not cast a recognizable shadow on the plain plate. Whether or not a gall-stone will cast a shadow depends on the amount of calcium present. About 90 per cent of urinary calculi cast recognizable shadows. About 10 per cent of gall-stones cast shadows comparable to those of the average urinary calculus. By a careful technique, seeing that the patient does not breathe or move during the exposure, and by proper regulation of the penetration for each case, the maximum number of biliary calculi can be diagnosed by the radiologist.

Of the gall-stones removed at the Cleveland Clinic, 70 per cent were diagnosed pre-operatively by the X-ray department.

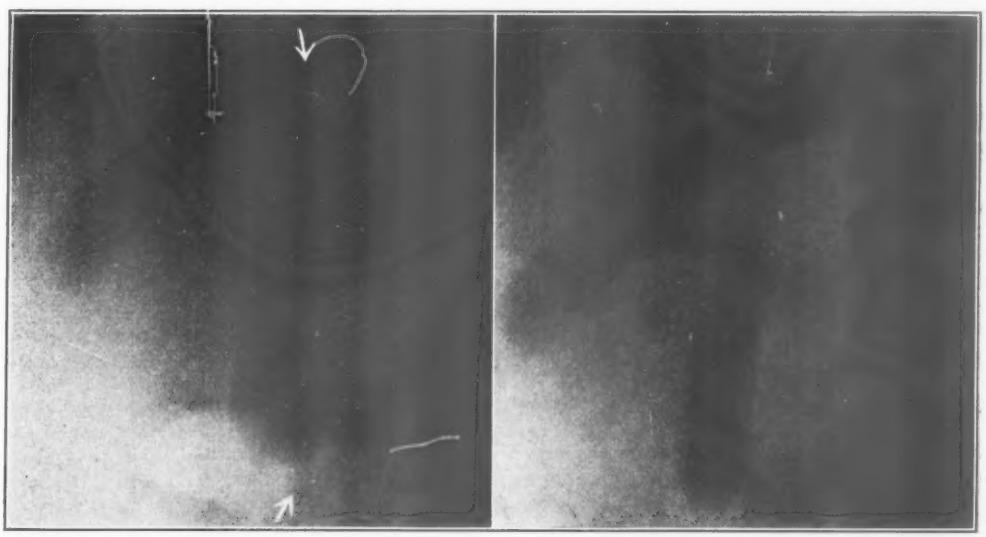


Fig. II. A. Dye filled gall-bladder. B. Emptying gall-bladder after fat meal.

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The differential diagnosis of shadows in the area involves principally kidney stones, but calcified glands, enteroliths, foreign bodies, calcifications in blood vessels, calcifications in the right kidney, artefacts in the plate and even skin blemishes may give rise to suspicious shadows. Stereoscopic plates are of distinct advantage, giving a better idea of the relative position of the shadow as anterior or posterior or within or without the kidney outline. Calcified glands are usually more irregular in outline than calculi, enteroliths will usually have passed on at a second examination, an artefact is not present in all plates. Warts and the like on the skin are apparent on examination of the body surface.

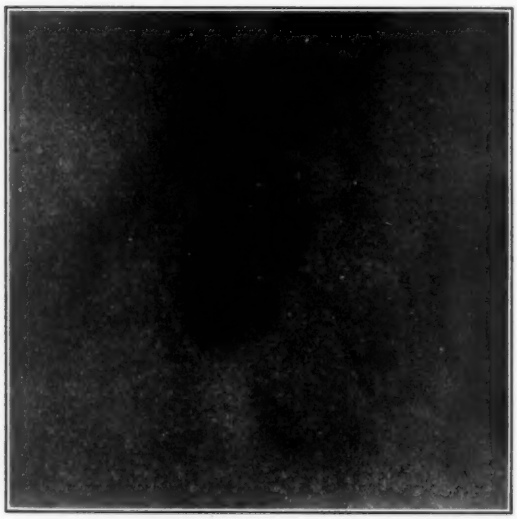

Fig. III. Double or sacculated gall-bladder containing cholesterin stones.

Calcifications in the kidney, tuberculous or otherwise, and calculi in the pelvis and ureter may require a pyelogram for proper diagnosis. However, even here the regularity of the gall-stone outline, the tendency toward multiple rather than single gall-stones and the fact that calcium is often present to any extent only in the outer layers of a gall-stone giving rise to a ring type of shadow, as contrasted to the denser more homogeneous though irregularly outlined kidney stone, often makes differentiation possible.

Dr. Nichols has for some time applied the principle used in localizing foreign bodies to gall-stones, and thus obviated the necessity of pyelograms in many cases. Two exposures are made, one posterior-anterior and the other anterior-posterior. In the posterior-anterior or gall-bladder film the gall-stone is farther from the target of the tube and closer to the film, hence the shadow is smaller and more distinct in outline than in the anterior-posterior or kidney film. It is likewise lower in position and closer to the shadow of the vertebral column. (Figure 1). By these criteria a diagnosis of gall-stones can be safely made.

Cholecystography

The function of the gall-bladder is a moot question. That it fills with bile there is no doubt, and it probably serves to regulate the pressure in the common duct as well as to store and concentrate bile during the interdigestive intervals when bile is not flowing into the intestine.

By the use of tetraiodophenolphthalein, following the work of Graham, we can determine whether or not the gall-bladder fills, something of its capacity to concentrate the bile, and whether or not it empties properly. From this data rather definite conclusions in regard to the gall-bladder can be reached.

Oral administration of the dye has proven very satisfactory, and this is the routine adopted at the Cleveland Clinic. Perhaps it would be well to give the technique in some detail.

When the patient reports to the X-ray department, plain films are made—at least one anterior-posterior and one posterior-anterior. The patient is then given an ampoule or fifty grains of the fresh dye, tetraiodophenolphthalein, in a sufficient number of double capsules, the smaller capsules containing the tetraiodophenolphthalein being enclosed in a larger capsule containing about ten grains of sodium bicarbonate. One capsule is taken at nine P. M. and one every twenty minutes thereafter until all, usually six, are taken. The usual meals are allowed before taking the capsules. At nine o'clock the following morning the patient reports to the X-ray department without having had breakfast. A plate is taken which normally shows a well filled gall-bladder and absence of the capsules in the intestinal tract. Faint shadows will be present especially in the colon area due to dye mixed with the intestinal contents. Three hours later while the patient is still fasting, another plate is taken. This normally shows the gall-bladder still filled, the shadow being somewhat denser and perhaps a

little smaller, the increased density being due to a larger portion of dye or to concentration due to absorption of bile by the gall-bladder. The patient is then instructed to eat a meal

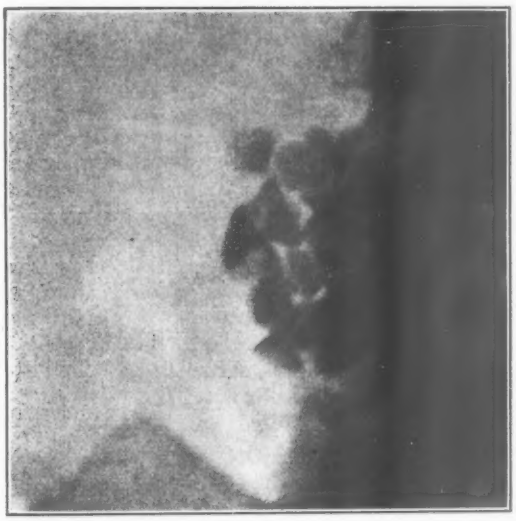

Fig. IV. Typical gall-stones low and close to spine. A single stone in this area might be lost in the spine shadows.

containing considerable fat in the form of bacon and cream and to report in two hours, when another plate is taken. This plate normally shows the gall-bladder shadow smaller, evidently emptying. (Figure 2).

Using this technique only one patient has vomited the dye and this was a rather nervous type of individual. Occasionally a patient complains of a little nausea, and three or four have had a mild diarrhea.

A gall-bladder which fills and empties within the above periods may be said to be functioning properly. However, occasionally stones will be seen either as shadows or as filling defects. (Figures 3, 4 and 5). Once a calcified wall was demonstrated in a gall-bladder which fulfilled the above conditions for filling and emptying. Usually, if there is a stone in the gall-bladder which fills, concentrates and empties within the above time it is a cholesterin stone. The presence of these stones seems to be consistent with very little actual damage to the gall-bladder.

If the gall-bladder fails to fill the test should be repeated. If then it fails to fill and there is no evidence that the dye was not absorbed it is safe to say that the gall-bladder is pathological.

Delayed filling should be interpreted cautiously. The fault may be in the excretory power of the liver or the absorption of the dye.

An exploratory laparotomy was done on one patient because of clinical symptoms although the gall-bladder was reported normal from the X-ray and dye standpoints. The gall-bladder however appeared normal at operation and was not removed.

One case having vague clinical symptoms, but whose gall-bladder failed to fill at two examinations was found at operation to have a small contracted gall-bladder with stones and calcifications in the wall, none of which showed on plain plates.

Summary

1. By careful technique about 70 per cent of gall-stones can be demonstrated radiologically.

2. By the two plate method usually gall-stones may be differentiated from the kidney stones.

3. By the use of the Graham method of gall-bladder visualization we can get evidence of function or non-function of the gall-bladder not obtainable in any other way.

Fig. V. Typical gall-stones. Note relation to crest of ilium. Gall-bladder films should always include the upper pelvic region.

4. Some stones are recognizable as filling defects in dye plates which would otherwise not be diagnosed by X-ray.

CONTACTS IN PUBLIC HEALTH WORK.*

By ROY K. FLANNAGAN, M. D., Richmond, Va.
Assistant Health Commissioner.

Unappreciated Values

The State Board of Health of Virginia has under its present policies and leadership been

*Paper read before the State Conference of Public Health Workers in Richmond, February 17, 1927.

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at work nearly nineteen years, and though much has been done to reduce disease and to promote health in Virginia in that time, it is yet a fact that in only a few places at best has the improvement and maintenance of the public health been accepted for what it really is—the most important of all functions of government,—the only one, in fact, that seeks to keep unimpaired the health and life of the people, the factor in human economy without which all others are worthless. In estimating our progress, therefore, it would be well for each health worker to realize that he, the conservator of that wealth, has not as yet fully impressed upon the public his tremendous value as a practical economic unit in the governmental scheme; in other words, he (or she) must get wise to the fact that he has not yet completely sold himself and his job.

The reasons for the comparative slowness of progress in health education are many, and nothing but time will cure many of them. Time is doing its work; those engaged in health work must do theirs. Some of the hindrances to health progress can be readily overcome. It is good sense to surmount them. Many are the helps to health work ready to hand. It is folly not to use them. Certain obstacles to the work are brought about by neglect of a necessary routine and much of the help that can be reasonably counted on by the health worker has to do with an attitude of mind that all can adopt. It is perhaps well to discuss for a little while some obvious but none the less important aspects of health practice that often escape detailed attention.

Help From the Public

The health worker's program is made up on the basis of definite and needed work and every energy should be applied to getting that work done quickly and, if possible, permanently. This cannot be without the help, physical and moral, of people. The more influential the people, provided there are enough of them, the easier the road to solid achievement. The health worker, like workers in other fields, will get little help from unfriendly folk. He should do his utmost, therefore, to reduce his unfriendly critics to the minimum. He must make friends and hold on to them. He will retain few friends if he does not do his work, but the hardest worker in the world will let himself out of a public health job if he does not show a friendly spirit in his contacts with the people.

Given this friendly spirit, coupled with knowledge of his job and energy to work at it, it is comparatively easy for a health worker to sit down with a moderately young, intelligent person having education above the fifth grade, and gain his acceptance of the truth of his health message and in the main his approval of the program he is trying to carry out. It is, however, difficult to make his message forceful enough to move that person to actively help in overcoming the prejudices and inertia of others older, less intelligent or alert. The majority in every community is uninformed in most progressive matters, and, though they readily respond to leadership, it takes real force of character and zeal in the leader to shake them out of old habits of thought and custom. Swivel-chair leadership will not do. It must be leadership by people who are out in front, earnestly and actively showing their belief in the matter at issue, not only with their minds but with their hands and their feet.

Name on Dotted Line

A man isn't really "sold" until he has signed up. The measure of success of the health worker is in the steady increase in the number of those who are willing to stand up and be counted as friends both to him and to his work; in other words, those who are willing to sign on the dotted line.

A salesman must know his "stock" and his "stuff" to start with. These meetings once a year, the bulletins of the State Board of Health, the visits and co-operation of workers from the home office and the experience gained in doing the job all help the worker to know his "stock." He ought, of course, not to be handling public health unless he is fully impressed with the fact that he has "good goods" to dispense. It will greatly help every worker if in the background of his or her mind is kept the fact that from the State Board of Health standpoint it is not a toxin-antitoxin campaign, not a sanitary privy or a good water supply, not a program of correctional work, not home nurse instruction or other segment of health work that is being offered to his people, but a greater measure of health and a more abundant life; that the thing presented at the moment, the clinic program, the sewage disposal system or what not, is but a necessary means to a great end, namely, a community eventually free from the handicaps of preventable disease, having the physical powers of its inhabi-

tants unimpaired and fully available for the building up of a prosperous and happy commonwealth. So much for the stock in trade. The health worker has the goods, now what is he going to do with them?

The Personal Touch

The problem of the health worker, as indicated in the beginning, is to induce the people in his field of activity to accept gladly what is offered, and to pay the price, not only because a good thing is presented to them, but because they have been convinced that the health worker can and will deliver the goods. This cannot be done in a haphazard way. The health worker must day by day make friends not only incidentally because he is a friendly person, but deliberately and systematically. In other words, he must sell himself, and this involves contacts as personal as they can be made—a consciously planned, continuous campaign to make people think well of him and his work. These friendly contacts must be going on all the time in the course of the day's work as opportunity is afforded, but in no case should the following contacts fail to be made and maintained even though special effort should be required and definite time allotted in his schedule for doing it:

1. Contact with headquarters—State Board of Health.
2. Contact with the local board of health.
3. Contact with the county or town governmental authorities—supervisors and town councils.
4. Contact with the school authorities—superintendents, principals, and teachers.
5. Contact with the physicians.
6. Contact with the general public—individuals and organized groups. Taking these up in order, we have:

1. *Contact with Headquarters.* — Contact with the State Board of Health should be maintained through the recognized head of the local health service—if a health unit, through the health officer; if other independent services, through the public health nurse or the sanitary officer, as the case may be.

It would seem that the necessity for maintaining close contact with the State Board of Health, which is responsible for the health workers and the work they accomplish, would be so clear that no one would fail to keep in touch; however, there have been some conspicuous failures in health services largely because the health worker did not keep headquarters sufficiently informed about the difficulties as well as the alleged progress of the work. Regular contact with headquarters is maintained by detailed reports and supplementary communications, as need arises.

Reports, with all of their time-consuming disagreeable implications, are absolutely necessary and cannot be neglected with impunity. Reports, of course, must be made on the faith of records regularly kept. This implies a program laid out in advance and a daily record at local headquarters, stating where the health worker plans to be at a given time and what he or she is supposed to be doing. A weekly sheet laid out by days should record the accomplishments of the week with such modifications as it has been necessary to make in the anticipated schedule; a diary notebook should always accompany the worker and no item of importance should be left out of the record. A specified time should be set aside each week for record keeping, and no other work, except real emergencies, should take precedence. No health worker in our generation will ever completely compass his job; so, however active he may be, something must be left undone. He need have no fears, therefore, that his work will be prejudiced in any essential degree by the time lost from work in making reports: on the contrary, he can rest assured that in the eye of his superiors a comprehensive though terse report of real work done will show that he not only can work but is willing to be judged by his record. The State Board of Health can be of immense service to workers in the field through its various bureaus, and reasonable demands upon it will always be met, though, of course, the service cannot always be exactly "on tap." Health workers must by all means keep in touch with headquarters.

2. *Contact with the Local Board of Health.* —Last year at this meeting I emphasized the necessity of the health worker, whether health officer, nurse or sanitary inspector, fully recognizing his or her subordinate relationship to the local board of health. It goes without saying that contact with the members of this board should be maintained. Enlightened local public health sentiment is represented by this board, and if it is not fully informed of the activities of the health worker and thereby not in position to give the facts when there is criticism of a given course of action by the worker, then trouble accumulates. The local

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board of health is or should be the staunchest friend of the health worker. This friendship should be cultivated to the utmost by the closest possible touch. Local boards of health are supposed to have stated meetings. The health worker should regularly appear at these meetings with report of work done and to receive such advice and suggestions as the board may see fit to give. In the intervals between board meetings, communication by visits and otherwise should be frequent. Close contact with the local board of health is an absolute essential in health work.

3. *Contact with County or Town Authorities.*—It is from the board of supervisors and from town councils that support for county and town health work should come and the members of these bodies should early be made to feel their responsibility in this connection. This is true whether funds large or small are provided from the county or town treasury. The promotion of the well-being of the people in town and country, which is the active job of the health worker, is a paramountly important part of the business of government, and if the worker does not on all proper occasions emphasize this point of view before the representatives of the people, it may possibly not be fully realized. These governmental bodies are only too glad to be kept in touch with county and town affairs, and they usually like to be convinced that the way they are spending public money is wise. If the health worker can demonstrate this as a fact so far as his appropriation is concerned, then something like permanency to his work will be assured. These officials are not used to spending money to prevent trouble. They understand the necessity for schools, roads, courts, police, jails, almshouses and medical care of the indigent sick, but their contact with the preventive idea is recent, and it is the duty of the health worker to gain the attention of the individual officers and show the value and reasonableness of his program. Health workers must keep in touch with local officials.

4. *Contact with the School Authorities.*—All health work must be preceded by and accompanied by public health education. The school is the great center for education of all kinds. The great majority of people over forty years of age learned nothing about disease prevention at school, and many of them in consequence are woefully ignorant of its principles now. It is, therefore, of utmost importance that the educational system of a given locality be thoroughly imbued with the importance of the health program and that the full co-operation of the superintendent, principals and teachers be secured in carrying it out. This means that the most cordial relations must be maintained by the health worker with the educational authorities. While health is more important even than education, the health worker should, in his or her efforts to improve school health conditions, never act superior, but should make approach to the one in authority at the school as to a public servant who shares with the worker responsibility for the health and bodily vigor of his charges. It is of the utmost importance in contacts with schools and school children that due deference be given those in charge. This rule should apply to colored as well as to white schools, for discipline and good morale are as important in one place as in the other. The health worker must keep in touch with the educational forces of his bailiwick.

5. *Contacts with the Physicians.*—The active aid of the profession devoted to restoring to health those who suffer from the diseases the health worker is combating should, if possible, be secured. Rapid improvement in community health cannot be accomplished otherwise. The doctors know when and where sickness first occurs and where it is most prevalent, and are in the best position to discover early the source from whence it springs. Their advice and assistance is virtually indispensable, and it is to their everlasting credit that they are usually willing freely to do their part. The health worker should be most careful to consult with them on all possible occasions and observe with scrupulous care the reasonable boundaries between prevention of disease and its cure. When there is question in the worker's mind in regard to a course of action, give the physician the benefit of the doubt and, if the matter seems important, let the board of health settle the point at a future time. The physician is potentially the health worker's greatest ally. Intimate touch with the medical profession wherever possible must be maintained.

6. *Contact with the General Public.*—All of the views previously expressed in regard to contacts of health workers with different groups and special individuals, lead up to the great task of the health worker—the establishment of proper relations with the general pub-

lic whose welfare the health program is designed to promote. Perfect community health is the object aimed at, and the community must, if possible, be arrayed solidly behind the effort to achieve it. The specific duty of the worker may be to deal with only a few phases of the big job. He must devote himself to doing these thoroughly, and in every possible instance join hands with those devoting their time and activities to other aspects of the same large task. To this end, the interest of every organized group committed to community betterment must be cultivated and, if possible, enlisted. Every community has one or more of these—community leagues, Red Cross chapters, women's clubs, parent-teacher associations, health and tuberculosis committees or societies, farmers' organizations, business men's clubs, chambers of commerce, etc. The progressive public sentiment, male or female, of the community is sure to be found associated with them.

Information Broadcast

When the object to which all health work is directed is once clearly understood, every forward looking citizen must help promote it. These citizens must, therefore, be made to understand by unremitting appeal to them through every avenue to their minds. Not the smallest part, then, of the health worker's efforts must be given to a well-designed and persistently pursued plan to spread public health information. The direct contacts of the worker, however active he may be, can only reach comparatively few. Bulletins of the State Board of Health should be used, not indiscriminately, but on all favorable occasions after the interest of the individual or group has been stirred. News items should be regularly furnished the local papers. Papers should be read before organizations and societies. Newspaper articles on timely health topics, movie picture health reels, posters, exhibits, lectures and demonstrations must be utilized as occasions arise—all in an effort to make it unmistakably clear that the health worker is a supremely valuable public servant whose every effort is put forth toward raising the standard of physical well-being in the community. An actively useful citizen and official like this soon makes himself indispensable.

Conclusion

Let me, in closing, reiterate what was stated in different terms earlier in this address—that the great conception behind all true public health activity should always be constantly in the health worker's mind: First, a community—his field of activity, completely sanitated and safe. Second, a commonwealth—his State thoroughly aroused to the necessity for adequate health protection. Third, a nation—his country, freed as far as it is humanly possible, from all forms of preventable disease, with all its human resources unimpaired and ready for the helpful and glorious part that that country should play before the world.

Correspondence

Tissue Diagnosis in the Operating Room. And Immediate Cover-slip Examination of all Fluids and Pus.

Baltimore, Md.,
February 3, 1927.

To the Editor:

I will consider it a courtesy if you will publish this letter in your journal, as I am anxious to come in correspondence with pathologists and surgeons interested in the immediate examination, by frozen section, of tissue in the operating room and the immediate cover-slip studies of smears from all fluids and pus.

Microscopic examination of stained frozen sections has been possible for more than a quarter of a century. The staining of unfixed frozen sections with polychrome methylene blue and other stains is a well-established procedure. In many operating rooms in university and other large and small surgical clinics, provisions for these immediate diagnostic studies have not only been available, but have been in practical use for years. While, unfortunately, on the other side, this diagnostic part of the operating room is conspicous by its absence in many clinics.

Before 1915 it was rarely necessary for a surgeon well trained in gross pathology to need a frozen section to help him in diagnosis at the operating table. Since 1915, and especially since 1922, the public has become so enlightened that malignant disease formally easily recognized either clinically or in the gross, now appears in our operating rooms devoid of its easily recognized clinical and gross appearance and can only be properly discovered by an immediate frozen section. The majority of operating rooms are not equipped or prepared for this new diagnostic test.

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The first essential part for this diagnosis is the technician—one to cut and stain the frozen section, or to make and stain the smear. The second is a pathologist trained to interpret it. It is possible for the surgeon to be all three in himself, and some young surgeons are so equipped. In others it is a dual combination—surgeon and pathologist in one, and the technician. More frequently it is three—operator, technician and pathologist. It makes little difference whether it is one, two or three individuals, providing each has the equipment and training for this most difficult diagnostic test.

In the address as chairman of the surgical section of the Southern Medical Association, I discussed biopsy, and this paper has been published in the *Southern Medical Journal* for January, 1927 (Vol. XX, page 18.) A reprint of this paper will be sent to anyone on request. The chief object of this letter is to come in contact with surgeons and pathologists who are sufficiently interested in this problem to discuss it either by correspondence, or by attending a meeting in the surgical pathological laboratory of the Johns Hopkins Hospital, either the Monday before, or the Friday after the meeting of the American Medical Association in Washington.

Schools for technicians may have to be established in different sections of the country, and the surgical pathological laboratories of the medical schools and the larger surgical clinics should offer courses in this tissue diagnosis, so that surgeons may learn to become their own pathologists, or pathologists learn the particular needs of the surgeon in tissue diagnosis in the operating room.

It is quite true that when the majority of the public are fully enlightened, the surgeon will see lesions of the skin and oral cavity and the majority of subcutaneous tumors when they are so small that that their complete excision is not only indicated, but possible without any mutilation. The chief danger here will be a surgical mistake—the incomplete removal of an apparently innocent tumor. There is no necessity here for biopsy. If a proper local excision is done, no matter what the microscope reveals, that local operation should be sufficient. But when lesions of the skin, oral cavity and soft parts are extensive and their complete radical removal mutilating, then there must be biopsy to establish the exact pathology.

In tumors of the breast and disease of bone, for years, the diagnosis could be made clinically, or from the gross appearances at exploration. But now, in an increasing number of cases, the breast tumor must be explored, and the gross pathology of this earlier stage is not sufficiently differentiated to allow a positive diagnosis. Immediate frozen sections are essential to indicate when the complete operation should be done. The same is true of the earlier stases of lesions of bone. The X-rays no longer make a positive differentiation between many of the benign and malignant diseases, for example, sclerosing osteomyelitis and sclerosing osteosarcoma.

We must not only specialize in tissue diagnosis, but we must organize this department so it will function properly in as many operating rooms as possible in this country.

Then there is a final and most difficult question to consider. I doubt if it can be settled. What shall be done in those operating rooms in which there is no technician to make the sections and no one trained to interpret the microscopic picture? How can a piece be excised or a tumor removed, for example, from the breast, and this tissue sent to some laboratory for diagnosis without incurring the risk of the delay to the patient? I have discussed this point in my paper on biopsy.

JOSEPH COLT BLOODGOOD, M. D.,
Surgical Pathological Laboratory,
Johns Hopkins Hospital.

Miscellaneous

An Appreciation of Lawrence Roane Waring, M. D.
1826—1869.
Being Some Brief Notes on the Life and Medical Practice of a Virginia Physician of Bygone Days.

By J. B. H. WARING, M. D., Blanchester, Ohio.

On a commanding knoll in Hollywood Cemetery, Richmond, hallowed ground where rest in eternal sleep so many of Virginia's illustrious dead, a tall slender obelisk points ever skyward, marking the spot where rests the mortal remains of a Virgina gentleman and physician of another day,—a physician who lived and had his being in the simple and unassuming way which is ever the hallmark of the truly great. A few yards away J. E. B. Stuart lies buried; and about in every direction Virgina's dead sleep in silence. The in-

scription on this monument tells us that it was erected by the poor of Richmond to the memory of a Doctor Lawrence Roane Waring, who had passed away in 1869 at the comparatively early age of forty-three. Yet, in this brief space of life, he left an impress on the life of Richmond that time has not worn away,—a life that should ever be an inspiration to the true physician.

A descendant of the Warings of Essex County, Virginia, Lawrence Roane Waring brought into his life the ideals of a long line of good Virginia citizens. He was born at "The Forge," near New Town, King and Queen County, Va., in 1826, the son of Horace and Isabella Roane Waring, to whom were born six children. Of his early life not much information is available nearly a hundred years later; but we know that he graduated at the University of Virginia in 1846 at the age of twenty, and began practice in Richmond. The Warings of that day were, in general, well-to-do planters, so that it is not likely a great deal of financial struggle and hardship entered his life at this stage. He was very devoted to his mother, and the story is that on her death-bed he promised to devote his professional life to relief of sickness and suffering amongst the poor.

At the outbreak of the Civil War, he organized and commanded a company from King and Queen County, but it seems that his forte was not military brilliancy. Always rather eccentric, he apparently did not take kindly to the restrictions of military life, or lacked the ability to discipline troops; so that his career as a military line officer did not compare, for instance, with that of his doctor kinsman from Essex, Captain William Latane, M. D., whose tragic death and burial has been immortalized in Southern annals in the poem and the painting, "The Burial of Latane." At any rate, after a few months Dr. Waring was relieved from duty with troops and placed in charge of one of the military hospitals in Richmond, where his professional services were very creditable throughout the remainder of the War. After the War was over, he resumed his practice in Richmond until he died in 1869, an early victim to nights and days of over-work amongst his beloved poor. The good doctor is reputed to have never sent a bill or asked payment for his services; and no call for his services went unanswered night or day. On his death-bed, he gave instructions that his books should be burned so that no bill could ever be sent to any of the poor he had ministered to.

In this day and age, when the economic urge, so-called, makes it practically necessary for the successful physician to conduct his professional practice on sound business lines, we are unable to comprehend the life and conditions of this good doctor. He never married; and apparently his wants and needs were few and simple. His income, whatever it was, seems to have been sufficient to maintain his modest office on Franklin Street in the old Richmond. We are told that when he required a new suit of clothes and went to a tailor shop to purchase, he would receive the suit all right, but would not be allowed to pay for same. Likewise, when his many patients and admirers saw that his faithful horse was about worn out with the labors of the day, straightway they would get together and present him with a fresh one. In this way he kept going on his professional rounds until one day in the year 1869 he laid down on his bed to rest, and arose no more. After his untimely death, Dr. William Wallace Gordon fell heir to most of his large practice, and, in turn, also died comparatively young, a victim of the same overwork.

Through the courtesy of Mrs. Charles LeLon, of Richmond, whose mother's people were patients of Dr. Waring's, we are able to quote a newspaper account of Dr. Waring's funeral, found pasted in an old family Bible.

"Funeral of Dr. Waring—Touching Scenes.

"Seldom have we witnessed more touching scenes than have followed the death of Dr. L. R. Waring. We have before spoken of the crowd of persons besieging all day Saturday and Sunday the room on Franklin Street, where his mortal remains are laid out, and of the spontaneous, heartfelt tributes of the mourners to his worth.

"A similar scene was presented on Sunday when the remains were followed by a procession of hundreds, in carriages and on foot, from the office to the church, and from the church to the cemetery, although a keen, cold wind was blowing, and the clouds of flying dust almost cleared the streets of other persons. The funeral took place at St. John's Church. The house was crowded to overflowing, while many were unable to gain admis-

sion. Rev. Harry Wall, the rector, read the burial service of the Episcopal Church, and made a few eloquent remarks, affecting to tears many in the immense congregation.

"As the hearse moved off, one hundred and five carriages joined the procession, and a large number of people, representing all classes of our population, took places in line on the sidewalk. The coffin was literally buried in flowers; and the Doctor's favorite horse, led in the procession, was also covered with floral decorations—the tributes of the poor.

"At St. Patrick's Church (Catholic) Rev. Father Hagan announced the death of Dr. Waring to his congregation, and requested the prayers of the people for the soul of the deceased. Here, too, much feeling was manifested, showing that the regret at the demise of this useful man is not limited to any particular sect or class, but is universal."

In this simple newspaper account, we read at once a tribute to the man, and an inspiration to the Virginia doctors of the younger generations to take up and to carry on the work of our honored profession; so that, when the time comes for us one by one to be gathered to our Fathers, we will at least leave the impress of a good physician's life well—even fully—lived. More we cannot ask.

In the preparation of this brief, fragmentary account I wish to acknowledge my indebtedness to Dr. C. A. Bryce, Mrs. Charles LeLon, and Mr. W. L. Waring, of Richmond; Lawrence Waring, Esq., of Norfolk, Va., Roane Waring, Esq., of Memphis, Tenn., and to any others who may have assisted me in the work.

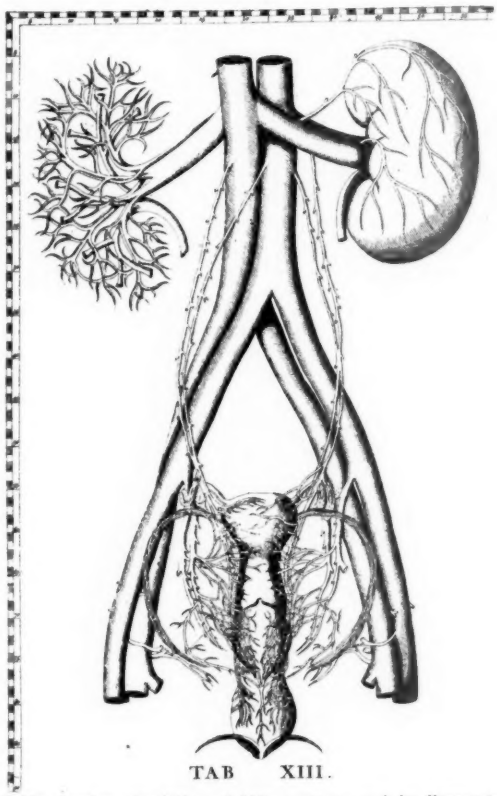
November 17, 1926.

Bibliotheca Obstetrica

Eustachius.

Eustachius (Bartholomaeus) [1520-74] Tabulae anatomicae, quas e tenebris tandem vindicatas et Clementis XI, Pont. Max., munificentia dono acceptas, praefatione notisque illustravit Jo. Maria Lancisius xliv, 115 pp., 47 pl.; 6 l. fol. *Amstelaedami, apud R. et G. Wetstenios*, 1722.

The first edition of these plates was brought out in Rome in 1714. They are the first anatomical illustrations to be made from copper plates. The plates were engraved by Eustachius himself and were completed in 1552. Over 150 years later, they were discovered in the Papal Library and were given by Pope Clement XI to his physician Lancisi, who at the instigation of Morgagni published them with explanatory notes. The Amsterdam edition was sponsored by Boerhaave and Albinus. Had these tables been published in Eustachius' life time, they would have made Eustachius a worthy rival of Vesalius as the Father of Anatomy. Eustachius studied the intimate structure of the organs by means of glasses and used such methods as injection and macer-



TAB XIII.

Table showing circulation of kidney, uterus and its ligaments, and bladder.

ation of tissue, and desiccation. Besides the tube and the valve which bear his name, he described the structure of the teeth, the suprarenal capsules, the throracic duct, the sixth cranial nerve, the clitoris and its crura. His is the first accurate description of the uterus, and he understood the structure and circulation of the round ligaments.

It is generally thought that Eustachius was born in 1520, but the elaborate festal celebra-

tion, held at his birthplace, San Severino nelle Marche, near Salerno, in September 1913 under the patronage of the Minister of Public Instruction, throws some doubt on this date. The festival lasted the greater part of the month and consisted among other things of a three day congress of medical men of the district, in which many of the leading men of Science in Italy took part, the unveiling of a marble statue in the Cival Hospital and a bronze bust by Ercole Rosa. The City of Rome, according to the news item of the time in the *British Medical Journal* (Two Notable Anniversaries, *Brit. M. J.* 1913, ii:1171) is to affix a marble tablet to the anatomist's house in the Piazzo SS. Apostoli (it is now the Palazzo Guglielini). Little is known about the life of Eustachius. He began his professional career as private physician to the Duke of Urbino. He knew Latin, Greek and Arabic well, was physician to Cardinal Borromeo and also Cardinal Guilio della Rovere whom he accompanied to Rome. After the death of Columbus he was chosen professor of Anatomy at the Sapienza, which had been reorganized as the Roman University. He died in 1574, when he was on a journey to Fossombrone, whither he had been summoned to the sick bed of the Cardinal.

Besides the attractive title page which shows the new form of dissecting room, and a dissecting table that has four half circles cut out of it, so that the operator can approach more closely to the subject, the Amsterdam edition is interesting bio-bibliographically because it is associated with so many well known names. Eustachius made the plates, Pope Clement XI gave them to Lancisi who published them in Rome with explanatory notes, Boerhaave and Albinus brought out the Amsterdam edition. The preface contains a letter from Fantoni, Professor of Anatomy at Turin, another from Morgagni, a testimony from Carolus Majellus, the Librarian of the Pope, a note by Lorenz Heister, besides a poem to Eustachius by Pierre Pini and an epigram by Franciscus Soldatus. My own particular copy is further interesting in that it was presented in 1868 by a Homeopathic doctor to the noted medical hymn writer, Dr. Abraham Coles, "in acknowledgment of the high geninus of the Author of the Microcosm, the Medical Odyssey, a glorious Poem."

M. P. R.

Woman's Auxiliary Medical Society of Virginia

At the request of the officers of the Auxiliary, this space has been set aside for communications from them regarding matters of interest, both to the profession and to the women members of their families.

All communications should be addressed to Mrs. E. F. Truitt, Secretary, Westover Avenue, Norfolk, Virginia.

On to Washington!

In persuance of our President's message in the January issue of the VIRGINIA MEDICAL MONTHLY, "Why a Woman's Auxiliary." It appears that some of us are not sufficiently interested in our husband's profession—to say nothing of contributing to the relief of suffering humanity. I am not speaking of those counties which are already organized and doing splendid work, but of the vast majority of doctors' wives who never attend state conventions and whose counties are not organized. It seems that we would rather consume our time in extending club work, etc.

Why do we have to urge and entreat the Medical Auxiliaries to function, to get together and work out schemes for the betterment of mankind? Why does our appeal for more and better co-operation in state work not receive more support? We know the material is in Virginia as elsewhere; then why not organize or join your nearest unit and let the public know by your activities the good work that many doctors' wives are doing in their communities?

Our State Auxiliary works hand in hand with the National and the county units which form the state organization must function in order that the state organization may grow and spread its influence.

Where could we find a more earnest, self-sacrificing state president than our own Mrs. Southgate Leigh, of Norfolk, whose untiring efforts are an inspiration to each county president? We who attended the Norfolk Convention and saw the splendid work exemplified returned with renewed determination to further Auxiliary work in Virginia. We not only enjoyed the work reported by the different units, but we were delightfully entertained and enjoyed mingling together in the various social functions prepared for our pleasure.

Let's go to the National Convention in Wash-

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ington! The American Medical Association meets there in May. It is at the American Convention that the states receive the spirit of rivalry, and are inspired to greater achievement. Let us increase our efforts now, during the next two months, in order that our president will be enabled to make a favorable report for Virginia.

FLORENCE STARRITT HUGHES,
(MRS. T. J. HUGHES),
Press Chairman.

Roanoke, Va.

The Truth About Medicine

In addition to the articles enumerated in our letter of December 27th, the following have been accepted:

Robert A. Bernhard
Saf-T-Top Mercurochrome Solution 2 c.c.
Kansas City Oxygen Gas Co.
Ethylene for Anesthesia (Kansas City Oxygen Gas Co.)
Eli Lilly & Co.
Erysipelas Streptococcus Antitoxin—Lilly (Concentrated Globulin)
Parke, Davis & Co.
Antistreptococcus Serum 20 c.c. piston syringe.
Antistreptococcus Serum 50 c.c. piston syringe.
Swan-Myers Co.
Arizona Ash Concentrated Pollen Extract—Swan-Myers; Crab Grass Concentrated Pollen Extract—Swan-Myers; Goose Grass Concentrated Pollen Extract—Swan-Myers; Mountain Cedar Concentrated Pollen Extract—Swan-Myers; Ox-Eye Daisy Concentrated Pollen Extract—Swan-Myers; Plantain Concentrated Pollen Extract—Swan-Myers; Yellow Fox-Tail Concentrated Pollen Extract—Swan-Myers.

NEW AND NON-OFFICIAL REMEDIES

Gynergen —Ergotamine Tartrate.—The normal tartrate of the principal alkaloid of ergot. Gynergen stimulates the motor nerve endings of the sympathetic division of the autonomic nervous system, thus causing an increase in blood pressure, contraction of the uterus, etc. It is proposed for use when the action of ergot to produce uterine contractions is desired. It is contraindicated when a tonic contraction of the uterus is undesirable. Gynergen is administered intramuscularly or hypodermically, and orally. The product is supplied in the form of Ampules Gynergen, 1.1 c.c. and Tablets Gynergen, 0.001 Gm. H. A. Metz Laboratories, Inc., New York.

Ampoules Glucose (Dextrose, U. S. P.) Lilly 10 Gm., 20 c.c.—Each ampule contains Dextrose, U. S. P., 10 Gm.; cresol 0.1 per cent and distilled water to make 20 c.c., buffered with sodium phosphate. Eli Lilly & Co., Indianapolis.

Ampoules Glucose (Dextrose, U. S. P.), Lilly, 25 Gm., 50 c.c.—Each ampule contains Dextrose, U. S. P. 25 Gm., distilled water to make 50 c.c., accompanied by an ampule containing 2 c.c. of a buffer solution. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., January 8, 1927, p. 101).

Ethylene for Anesthesia.—It contains not less than 98 per cent by volume of ethylene. Trials on human subjects have confirmed the anesthetic and analgesic value of ethylene as demonstrated by animal experiments. Deep surgical anesthesia is stated to be produced easily, and analgesia comes on readily and apparently long before anesthesia is established. A considerable number of trials give promise that ethylene is of value for the production of surgical anesthesia and that it has advantages over nitrous oxide. Ethylene for anesthesia is supplied in compressed state in metal cylinders.

Ethylene for Anesthesia (Kansas City Oxygen Gas Co.)—A brand of ethylene for anesthesia—N. N. R. Kansas City Oxygen Gas Co., Kansas City, Mo. (Jour. A. M. A., January 29, 1927, p. 323).

PROPAGANDA FOR REFORM

The following products have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs Act: Glycero-Celery Tonic (Brunswig Drug Co.), consisting of potassium bromide, glycerin, extracts of plant drugs, sugar, alcohol and water. T. S. B. Liverclean (C. M. and R. Tompkins), essentially Glauber's salts, Epsom salts, sugar and a trace of plant extract dissolved in water. Womanette (Capital Remedy Co.), consisting of potassium bromide, extracts of plant drugs (including sassafras), alcohol, water and a trace of a salicylate. Sirup of Ambrozoin (American Apothecaries Co.), consisting essentially of ammonium chloride, sodium and potassium bromides, small amounts of plant extracts, a trace of creosote, benzoic acid, alcohol, sugar and water. Angelus Compound Sirup of Hypophosphites (Brunswig Drug Co.), consisting of sodium, iron, manganese, quinine and strychnine hypophosphites, traces of calcium and potassium salts, glycerin, sugar and water. Brunswig's Compound Fluid extract Buchu (Brunswig Drug Co.), consisting essentially of potassium acetate, extracts of plant drugs, glycerin, alcohol and water. Allen's Lung Healer (H. J. Allen Co.), a partly emulsified mixture of mineral oil, about 30 per cent, volatile oils, including anise oil, about one-half of 1 per cent, extracts of plant drugs, including licorice, sanguinaria, benzoic acid, sugar and water. Whitlock's U-GR-GL (Cherokee Remedy Co.), essentially a dilute, watery solution of washing soda flavored with menthol. (Jour. A. M. A., Jan. 1, 1927, p. 48).

The Lead Treatment of Cancer.—At a recent meeting of the British Medical Association, a full summary of the results to date was presented by members of the staff of the Liverpool Medical Research Organization The clinical survey indicates that there is promise of therapeutic benefit in a few selected cases of otherwise hopeless cancer. The preliminary task before treatment can be begun is the selection of patients who may possibly obtain benefit. The lead suspension which Blair Bell uses contains fairly fine particles, some of which are metallic lead, and some lead hydroxide and lead carbonate. The mixture is more toxic than pure colloidal lead, but it is also more effective in the destruction of tumors. Commercial products are not as yet available, but several laboratories in this country and in England are experimenting with various preparations, hoping soon to be able to develop a standardized and reliable product. It seems that Blair Bell has shown that when employed under cited limitations and by those who possess proper laboratory facilities and clinical experience, lead therapy offers to a small number of persons affected with inoperable tumors, a chance to escape the consequences of the disease. But before any widespread use can be made of the method, some

means of removing lead from the body to control acute or chronic poisoning should be developed. The whole situation is thus frankly in the experimental stage. To carry out the treatment at all, requires hospitalization of the patient for some months, laboratory and clinical facilities not everywhere available and funds for frequent transfusions. It seems improbable that the method will ever replace surgery or compete with irradiation, but it has already accomplished something in patients in whom one or both of these procedures had failed. (Jour. A. M. A., Jan. 8, 1927, p. 103).

Nonspecific Protein Administration.—The intravenous injection of typhoid vaccine with an initial dosage of fifty millions, each subsequent dose increased by one hundred millions, and given at four-day intervals, is one of the most reliable means of producing fever. It is a drastic measure and one should be certain that the patient's vital organs are sufficiently healthy to withstand the attacks of fever thus produced. The intramuscular injection of milk skimmed by centrifugalizing and sterilized by boiling in the water bath for ten minutes, has good pyogenic properties without great toxicity. The usual dose is 5 c.c., gradually increased to 10 c.c. With those who have a tendency to strong febrile reactions, small doses should be given at first. The injections must be adjusted to avoid severe reactions and anaphylactic shock. (Jour. A. M. A., Jan. 8, 1927, p. 119).

Kloron.—Qualitative tests made in the A. M. A. Chemical Laboratory indicate that Kloron Tablets (J. I. Holcomb Mfg. Co.), contain Chloramine—U. S. P. as their potent ingredient. The claims made for the preparation are typical of the extravagant exploitation of official products by the "patent medicine" route. (Jour. A. M. A., Jan. 8, 1927, p. 119).

Sodium Bromide Intravenously.—Sodium bromide may be injected intravenously provided the liability of such an injection causing colloidoclastic shock is reckoned with. It seems, however, that mere "gastric distress" would call for better dilution of the dose given by mouth, as with a tumblerful of milk, or for introduction by way of the rectum, rather than intravenous injection. (Jour. A. M. A., Jan. 8, 1927, p. 120).

Cass Treatment for Rheumatism.—One hundred and thirty-seven West Sixty-Second Street, Chicago, houses a choice line of quackery. Under the names "Western Medical Association" and "Vernon Laboratories" a fake "epilepsy cure" is exploited on the mail order plan. Under the name "Cass Laboratories," nostrums for rheumatism, sciatica, neuralgia, lumbago and gout are sold—also through the United States mails. The A. M. A. Chemical Laboratory reports that the "Cass Treatment" consists of pink tablets, "Special Saline Compound" and gray tablets. The Laboratory found the pink tablets to contain 0.6 Gm. of sodium bicarbonate per tablet. The "Special Saline Compound" was found to be essentially flavored magnesium sulphate. The gray tablets were found to contain essentially 0.16 Gm. acetylsalicylic acid, 0.13 Gm. cinchophen and 0.3 Gm. charcoal per tablet. From the Laboratory's report it is seen that this wonderful discovery "developed under the direction of the Head Professor of Chemistry at one of the nation's largest Universities," and declared by "two of the foremost medical scientists in this country" to be superior to anything else in its line, is merely a combination of acetylsalicylic acid and cinchophen with sodium bicarbonate and magnesium sulphate. (Jour. A. M. A., Jan. 15, 1927, p. 189).

Physical Therapy and Pseudophysics.—Much of the literature on physical therapy has apparently been written with an eye to the royalty statement or the publicity returns rather than to the possibility of scientific criticism. These treatises become impressive, in size, at least, by the inclusion of statements on the physics of the apparatus culled almost in toto from the advertising and descriptive matter published by a manufacturer. This practice might be commendable if the physical concepts were not often wholly at variance with the concepts generally accepted by physicists. The physician who desires a substantial knowledge of physical therapy must choose his sources of information carefully. (Jour. A. M. A., Jan. 15, 1927, p. 175).

Diamel in Diabetes.—Diamel tablets are manufactured by the Maltbie Chemical Co. They are stated to contain "Lithium Carbonate 1½ grs.; Sodium Arsenate 1/20 gr.; Strychnine Arsenate 1/180 Gr.; Ext. Jambul Seed, ½ gr.; Ext. Gentian, ½ gr." The product is marketed with the claim: "This tablet is employed for the reduction and elimination of sugar in the urine, which it is said to do rapidly. A trial will speedily prove the efficiency of this formula." None of the components of Diamel tablets have any specific effect on the course of diabetes. (Jour. A. M. A., Jan. 22, 1927, p. 267).

I-on-a-co—The Magic Horse Collar.—California was not satisfied when it gave us the greatest piece of quackery, the electronic reactions of Abrams. Now we are treated to another piece of electrical hocus-pocus which comes from California: I-on-a-co, alleged to have been invented by one Gaylor Wilshire, and exploited by the I-on-a Company, of Los Angeles. The device, one gathers from the advertising, will cure cancer, Bright's disease and paralysis, change gray hair back to black and give girls who use it a "permanent wave." A committee which investigated the device, reported that I-on-a-co is simply a coil of insulated wire about eighteen inches in diameter, with a plug that permits the coil to be attached to an electric light socket. There is also a smaller coil that plays no part in the alleged curative use of the I-on-a-co, but plays an all-important part in the magical features of the scheme. This coil has its two ends attached to a miniature light socket containing a small flashlight globe. When the larger coil is plugged into an alternating current electric light socket there is, of course, generated within the large coil a weak fluctuating magnetic field. This will cause the globe in the small coil to light up when it is brought in close proximity to the large coil. This phenomenon, while elementary to a degree, furnishes for the uninitiated that element of mystery which is so necessary to the successful exploitation of any alleged cure for human ailments. The I-on-a-co is used by placing this magnetic horse collar over the neck, around the waist or around the legs of the person who thinks he is going to be helped by a piece of buncombe of this sort. (Jour. A. M. A., Jan. 22, 1927, p. 262).

Sale of Ultraviolet Generators to the Public.—The Council on Physical Therapy, on the basis of the available evidence, contends that the sale of generators of ultraviolet energy to the public for self-treatment is without justification. The Council bases its condemnation of the sale of such apparatus on the ground that harm may result from such use by the public; because unwarranted confidence in the therapeutic value of treatment with such apparatus may lead to attempts to treat serious conditions; because the possessor of such apparatus would fail to obtain a correct diagnosis of his condition, and because the practice would encourage the sale of useless and fraudulent apparatus. (Jour. A. M. A., Jan. 22, 1927, p. 245).

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Editorial

The Electrocardiograph.

The electrocardiograph is not an instrument for detecting valvular heart lesions, as such. There is no characteristic tracing of a mitral stenosis, a mitral regurgitation; of an aortic stenosis or aortic regurgitation. It does not record in any manner auscultatory phenomena of the heart. It does not denote the presence of a murmur or a bruit. It does not indicate the quality, time relation, or absence of heart sounds or heart murmurs. These physical factors of heart operation which are so valuable in physical diagnosis remain in the domain of auscultation.

It is only when cardiac muscular phenomena are to be investigated and recorded that one turns to electrocardiographic tracings. In the display of these important events, as disclosed in the cardiac cycle, the cardiopathic examination may be considerably added to by a proper interpretation of the tracings of the three leads of the electrocardiogram. The widespread use of the electrocardiograph is reason enough for a brief comment upon its tracings at this time. But it must not be taken to be a method that will ever supplant the ancient and honorable physical examination—by inspection, palpation, percussion and auscultation. Nor can it ever be used as a substitute for a discriminating judgment in dealing with cardiac disorders. There is reasonable basis for the position that the expert in physical diagnosis, well seasoned in practice and grounded, by contact with a large number of heart patients, in the knowledge resulting from an imperious urge of cardiac symptoms, will always be the court of surest resort, if ever a choice between the skilled clinician or the pure electrocardiographer arises. The fact is that, in our opinion, no electrocardiographer or cardiologist, as such, is best fitted to diagnose and treat the cardiopath, unless such a specialistic limitation is founded upon a wide experience in general medicine. In fact, a heart specialist can never get away from general internal medicine if he is to be the best sort of a heart specialist.

Sir Thomas Lewis may be taken as a foremost worker in electrocardiography. His published work upon this subject should be read carefully. His little book, published in 1913, entitled "Clinical Electrocardiography" is a careful and succient exposition of the subject. He wrote then that electrocardiography "is a direct means of examining the all essential heart muscle", and this may be considered the function of electrocardiography in heart studies. By its use, one may analyze common heart muscle disturbances and determine the mechanism of disordered heart action. The observation that an electrocardiographic study is rarely superfluous will not be questioned, because every added inquiry that may enable one to more nearly understand the nature of cardiac disturbance is desirable.

The use of the letters *P*, *Q*, *R*, *S*, *T*, in expressing component elements of the physiological heart beat, is an arbitrary one and was used first by the Dutch physiologist, Einthoven. The auricular contraction, or the contraction of the auricles, is marked by the upward and downward tracing P, terminating at the zero line. The underswing of this tracing or deflection denotes the first phase of the ventricular complex. This is Q. But it is not always present. Following this a steep, tall pointed summit and a precipitate decline, known as R, depicts a marked ventricular action. This is followed by a depression below the zero line; another expression of ventricular systole is denominated *S*. The contraction of the ventricle continues in evidence on the electrocardiogram, in a broad round summit T, which terminates the systole and marks the beginning of diastole.

Lewis says that P, the auricular representative, is found as a summit in all normal and young adult subjects and in all leads. There

are some minute variations in the summit, sometimes a bit horizontal or dipping, occasionally bifid. These P forms express the origin of the heart beat at the normal site and the passage of the "contraction wave through the whole of the auricular tissue in definite directions." This is the physiological auricular complex, so-called.

The physiological ventricular complex varies very much, but the deflection R and T are always present in it. Q and S may be absent. Amplitude and shape of deflections may vary in R, Q and S; and T may vary in direction.

If Q, R and S followed by a slow blunt T are found, the indication is that the ventricular contraction arises from fixed points and is propagated along the auriculo-ventricular bundle, to its main divisions and branches. Variations of the form and height of deflections of the electrocardiogram are found in normals.

There are three "leads." These leads are three directions of conducting the current which is Einthoven's modification of Waller's ten leads.

Lead I represents current being led from right hand to left hand. Lead II represents the currents being lead from right hand to left foot and Lead III from left hand to left foot. The first two leads are expressive particularly of contractile phenomena about the base of the heart: the auricles and upper part of the ventricle; lead III is expressive best of contractile phenomena of the right and left ventricles.

In all leads the R curve is marked but it is most prominent in II and T wave is directed upward from the base line, but Q and S are inconstant, even in normal electrocardiograms. Much more may be said of the variations of physiological electrocardiograms, but this is not the place for it. Comments that have been made are elementary in the extreme and are made merely to offer a hint of the nature and meaning of the electrocardiogram and to suggest inquiry into the meaning of this method of diagnosis, as well as to a clearer understanding by the general practitioner of electrocardiographic tracing of heart disturbances so frequently seen in publications of today.

Electrocardiopathic Nomenclature.

Studies of electric phenomena registered by a galvanometer string in heart contractions have produced a new and individualistic group of terms. Heart phrases, commonly used in inspection, palpation, percussion and auscultation of the heart, are rarely employed. A nomenclature and glossary quite limited as to electrocardiography has been acquired and it is worth while for one to obtain a knowledge of the terms used in electrocardiography if one wishes to read, to say the least, publications on the subject.

A few terms may be used to illustrate:

Relative Preponderance of Right and Left Ventricular Muscle is demonstrated, in association with valvular disease and compensatory hypertrophy, by rather characteristic changes in deflections of the R wave in the three leads.

Inversion of T is considered pathological in leads I and II. It is here an "ill omen". Aberrant contractions are contractions which are propagated from super-ventricular impulses. They choose abnormal channels of passage. Auriculo-ventricular heart block, partial and complete, denotes a state of interruption of passage in proper time and sequence of auricular contraction to ventricle. The auricular and ventricular contractions may beat simultaneously, giving what is called nodal rhythm.

Premature contractions and extra systoles are brought out often in electrocardiograms. These are abnormal contractions springing from some other than the normal pace-maker or sino-auricular node. These beats are said to be *ectopic*. Simple paroxysmal tachycardia, auricular flutter, auricular fibrillation are a few additional states of cardiac disturbances which have special phraseology in the electrocardiogram. The electrocardiogram in valvular lesions of the heart has nothing to do with the auscultatory features of diagnosis, but may assist in portraying cardiac muscle development and functional action.

News Notes

Tri-State Medical Association of the Carolinas and Virginia.

At the twenty-ninth annual session of this Association in Columbia, South Carolina, February 15 and 16, there was an attendance of more than three hundred. Dr. Robert Wilson, Jr., of Charleston, South Carolina, was elected President; Dr. F. C. Rinker, of Norfolk, Dr. W. B. Lyles, of Spartanburg, Dr. Wm. deB. MacNider, of Chapel Hill, were elected vice-presidents. Dr. James M. Northington, of Charlotte, was elected secretary.

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Dr. L. T. Price, of Richmond, was made a member of the Council to fill the vacancy left by the death of Dr. H. S. Belt, of South Boston. Dr. R. L. Payne, of Norfolk, was made a member of the Council for a period of three years. Virginia Beach, Virginia, was selected as the next meeting place, with headquarters in the new Cavalier Hotel.

In response to a suggestion in the Presidential Address of Dr. A. J. Crowell that the annual session be made longer than a two-day period, the matter of extending the next session through a four-day period was left to the discretion of the Council.

Conference of Virginia Public Health Workers.

During the week of February 14th to 19th, there was held in Richmond an institute for conference and training of the public health workers of the State. The groups and organizations participating were the staff and field workers of the State Board of Health, the Virginia Public Health Association, the Virginia Section of the Society of American Bacteriologists and the Virginia Tuberculosis Association.

The Conference was opened by an address on the "Fundamentals of Public Health" by Dr. Ennion G. Williams.

A number of professional men and women of national prominence took part in the program along with those in Virginia who are making public health history. Most of the phases of public health practice were dealt with profitably at this institute which was generally voted the best yet held.

That a conference of State health workers should be able to attract such a large number of distinguished specialists is a fine commentary on the public health work being done in this State. The visitors without exception paid tribute to the high quality of Virginia's contribution in the public health field.

The Virginia Public Health Association

Held its annual meeting in Richmond, February 16th, during the Conference of Public Health Workers of the State. Dr. R. W. Garnett, Danville, the president, presided and gave a most interesting address. A number of other excellent papers and talks were given. The one by Dr. Henry F. Vaughan, health officer of Detroit, on the procedure for conducting a thorough anti-diphtheria campaign in a large city, probably aroused the greatest discussion. This was followed by a clinic at one of the city schools.

Following a discussion on the question of a suggested state-wide milk ordinance, the Association adopted a resolution approving a minimum dairy standard for all milk sold in this State, but felt that no action taken by the State should limit the right of cities to maintain higher standards.

The following officers were elected for the ensuing year: President, Dr. Louis L. Williams, U. S. Public Health Service; vice-presidents, Dr. C. B. Ransone, health officer of Roanoke, and Miss Anne Gulley, public health nurse in Loudoun County; secretary-treasurer, Dr. P. S. Schenck, health officer of Norfolk. Dr. Schenck was also appointed representative to the American Public Health Association.

Virginia Tuberculosis Association.

During the Conference of Virgina Public Health Workers in Richmond, the middle of February, the Virginia Tuberculosis Association also held its annual meeting under the presidency of Dr. Charles R. Grandy, of Norfolk. In addition to the business meeting and papers by members, an address, open to the public, was given in the evening, by Dr. Linsly R. Williams, managing director of the National Tuberculosis Association, on the work of that association and its affiliated state and local branches.

Dr. R. A. Martin, health officer of Petersburg, was elected president for the coming year and Dr. R. K. Flannagan, Assistant State Health Commissioner, was re-elected secretary of the Board. At a meeting of the Board, Miss Leslie Combs Foster was appointed executive secretary.

Dr. R. Cannon Eley,

Of the class of '25, University of Virginia, Department of Medicine, will leave April the 1st for Willard Parker Hospital, New York City, where he will spend six months studying contagious diseases in children. Following this, he will go to "Children's Hospital" of the Harvard Medical School, Boston, Mass., where he will spend two years in the study of diseases of children under Dr. Kenneth D. Blackfan.

Foot-and-Mouth Disease Commission Gives Results.

The highly infectious nature of foot-and-mouth-disease virus, the extremely small size of its active agent, and its ability to escape

identification as to its true nature are the outstanding results of the year's study by the American commission which went to Europe in 1925 to study foot-and-mouth disease and is now preparing its official report, according to the U. S. Department of Agriculture.

Though highly technical, the findings of the commission show briefly that the virus of foot-and-mouth disease is extremely active and dangerous. It produced the disease experimentally when diluted as much as 1 part in 10 million. The organism is too small to be seen by the most powerful microscopes. The resistance of foot-and-mouth-disease virus to strong antiseptics also proved to be surprisingly great. Whereas 60 per cent alcohol kills ordinary bacteria within a minute it failed to destroy the virus of foot-and-mouth disease in 26 hours. The virus also showed abnormal resistance to other antiseptics, such as acetone, bichloride of mercury, and cresol. The commission reported that "foot-and-mouth disease is one of the most contagious diseases known."

It seems agreed that among animals the most effective and economical method of combating foot-and-mouth disease is by the slaughter and clean-up method, when limited to a small percentage of animals.

Civilization Not So Bad After All.

It has long been held that civilization has an ill effect upon the physical condition of primitive peoples, but an examination of the teeth of over 6,000 Bantu children living in Kraal villages of the Transvaal showed that less than 20 per cent of them were free from dental defects, while fully 45 per cent had at least mild physical defects due chiefly to malnutrition.

The Nansemond County Medical Society,

At its February meeting, elected Dr. Charles H. Dawson secretary to succeed Dr. C. F. Moriarty, who resigned when he accepted the position as health officer of Norfolk and Princess Anne Counties. Dr. Dawson is the new health officer of Suffolk and Nansemond County. At this meeting, interesting papers were read by Drs. J. E. Rawls, F. J. Morrison and W. C. Gibson. Dr. W. T. Gay, of Suffolk, is president of the Society.

Dr. William H. Parker,

Richmond, has been appointed a member of the electoral board of the City of Richmond.

Dr. P. D. Pence,

Of St. Charles, Va., recently visited relatives at Edinburg, Va.

Dr. H. Taylor Hawkins,

Of Clover, Va., has returned home after a visit to his parents in Richmond, Va.

Annual Report of St. Elizabeth's Hospital, Richmond.

The fifteenth annual report of this hospital for the year 1926 shows a large amount of interesting work accomplished. Sixteen papers were published in six different medical journals by members of the staff, eleven of which we take pleasure in announcing appeared in the MONTHLY.

The hospital cared for a total of 1,098 patients, with 1,625 out-patient visits. There were 856 operations, and 162 cystoscopies, and the total death rate was only 1.99 per cent. Laboratory examinations, not including routine gross and microscopic examinations of all specimens removed at operation, numbered 11,883. This report shows the diagnoses and operations for all cases and gives in the form of case reports a critical resume of the twenty-one cases which died.

Dr. H. L. Segar,

Of Warsaw, Va., was a recent visitor in Richmond, having come here on professional business.

Dr. W. E. Bundy,

Who has for the past nine years been associated with Dr. J. Louis McCarty at Berwind, W. Va., has recently moved to Minden, W. Va., where he is now physician for the New River and Pocahontas Consolidated Coal Company at that place.

School Hygiene and School Attendance in Egypt.

The chief medical officer of the school system in Egypt proposes to introduce during the current fiscal year the classification of elementary-school children according to intelligence, and special physical exercises for children who are not strong. The school physicians are also to fill out signed report cards on the health of each child. The minister of public instruction is planning to start compulsory school attendance, but estimates that it will take twelve years to make it completely effective.

Married.

Dr. John W. Wallace, Covington, Va., and Miss Irma Temple Robinson, of University of Virginia, in Richmond, February the 9th.

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Dr. John L. Tabb, Richmond, Va., and Miss Emily C. Crockett, Max Meadows, Va., February 1st.

Dr. R. M. Shelton

Has moved from Valentines, Va., to Unionville, Va., where he has taken over the practice of Dr. J. P. Hankins.

Dr. Jacob S. Rosenthal,

Formerly of Norfolk, Va., after a year in New York engaged in post-graduate work, has opened offices at 1422 Massachusetts Avenue, Northwest, Washington, D. C., and is limiting his practice to urology.

Dr. H. M. Snead,

Of South Hill, Va., has gone to Petersburg, Va., where he has taken over the office and practice of Dr. F. J. Wright, until his return to Petersburg.

Dr. W. L. Varn,

Recently of Cumberland, Va., has moved to South Hill and taken up the practice of Dr. H. M. Snead.

The American Board of Otolaryngology

Announces that the following examination dates have been assigned:

May 16, 1927, at 9 o'clock, at the Episcopal Eye, Ear and Throat Hospital in Washington, D. C.;

June 4, 1927, at 9 o'clock, at Spokane, Wash.

Dr. Hanau W. Loeb, of 1402 South Grand Boulevard, St. Louis, Mo., is secretary of the Board.

Dr. Frank E. Handy

Announces that his post office is now Inman, Va., instead of Toms Creek, Va.

Dr. E. Chisholm Cobb,

Who has been located for some years at Penola, Va., has recently had completed a residence at Ruther Glen, Va., and moved into his new home just before last Christmas.

Have You Made Your Income Tax Return?

If not, it should be sent or carried to the office of the Collector of Internal Revenue for the district in which you live or have your principal place of business before or on March 15, 1927. Failure to make a return, with the specified net income, may subject the taxpayer to a penalty.

Physiotherapy and Occupational Therapy Aides Urgently Needed.

The U. S. Civil Service Commission states that a number of hospitals of the Veterans' Bureau are sorely in need of occupational therapy aides in arts and crafts, agriculture, and trades and industrial occupations, and also physiotherapy aides, pupil aides, and assistants. These workers are needed in considerable numbers in connection with the rehabilitation of disabled soldiers and sailors.

It is stated that examinations for these positions are now open. Full information and application blanks may be obtained from the U. S. Civil Service Commission, Washington, D. C., or from the secretary of the United States Civil Service Board at the post office in any city.

Dr. Booker E. Rhudy,

For several years a member of the staff of the George Ben Johnston Memorial Hospital at Abingdon, Va., has moved to Greensboro, N. C., where he has opened offices in the New Piedmont Building. He is limiting his work to roentgenology.

Dr. P. K. Graybill,

Of Fincastle, Va., who has been spending some time in Arizona, has recently been taking care of the emergency work at Lake Pleasant, Arizona, where a big dam is being built to store flood waters for irrigation of forty thousand acres of desert land.

Dr. Arthur L. Jones,

Formerly of southwestern Virginia, is now located at Gilbert, W. Va.

Ten Health Commandments.

Our readers, many of whom know Dr. B. B. Bagby, formerly of this State but now health commissioner of Athens and Clark County, Georgia, will be interested in the following ten health commandments which Dr. Bagby has had printed to be distributed in the county covered by his work:

1. Eat Wisely: Much milk, green stuffs, fruit and whole grain bread; little meat and sugar; avoid alcohol and stimulants.
2. Exercise Freely: Stand and sit erect.
3. Use Your Lungs: Breathe fresh air day and night. Stay in the sunlight a part of every fair day.
4. Be Clean: Wash your hands before you eat; bathe often; clean your teeth morning and night.
5. Feel Well: Don't get over-tired; rest is your best friend. A 30 minute nap in mid-day is not laziness but good sense.
6. Be Regular: Don't break your appoint-

ments with yourself for meals, sleep, and bowel movements.

7. KEEP YOUR BALANCE: Hurry and worry serve no man. Play a little every day.

8. KEEP SAFE: Fight shy of the careless sneezer, spitter, the common drinking cup, and the home with open well or open toilet.

9. DON'T BE TOO SMART: When you are sick, go to bed and call a doctor. Few who do this promptly, die of pneumonia or flu.

10. BE THRIFTY: Invest in an examination by a doctor and dentist on your birthday every year; it will pay dividends.

Rockbridge County Medical Society.

At the regular bi-monthly meeting of this Society held February the 1st, at Jackson Hospital, Lexington, papers were presented by Dr. Joseph Seebert on "Basal Metabolism: Methods", with the showing of apparatus, and by Dr. H. L. Mitchell on "Benefits of the Tonsil Operation: Review of Literature". The members of the Society were unanimous in their endorsement of the use of toxin-antitoxin for preventing diphtheria. Dr. E. P. Tompkins and Dr. H. L. Mitchell, both of Lexington, are president and secretary, respectively of this Society.

Thirty Thousand Miles of Child Welfare.

Wisconsin sends out a traveling children's clinic called the "Child Welfare Special," which visits rural communities remote from cities and hospitals. During the past five years this "Special" has traveled about 30,000 miles, visiting 70 counties of the State and examining 23,579 children. Most of the children were infants or of preschool age, and more than three-fourths of them were found to have preventable or remediable defects. The doctor and nurse of the "Special" give no medical treatment but provide the parents with records of the physical difficulties of their children and suggest that they be taken to the family doctor. This traveling clinic is very popular, and many requests are received from parents, teachers, and local officials for its return.

New Pavilion at Blue Ridge Sanatorium.

The George W. Wright memorial pavilion at the Blue Ridge Sanatorium, near Charlottesville, Va., has just been completed. The entire fund for the erection of this pavilion was raised through voluntary contributions from Masons in all sections of Virginia and the dedicatory exercises and formal presentation to the State by the Masonic Lodge will be made early in April. The pavilion is modern in all respects and has a total of twenty-eight wards with two beds to the ward, besides nurses' quarters and all necessary offices. This pavilion will be open at all times to Masons in good standing and the dependent members of their families. In case all beds are not used by the Masons, they may be used by others desiring to enter.

The Wise County Medical Society

Held its annual meeting in Norton, Va., the latter part of February at which time the members were guests of the Norton Medical and Dental Society. Dr. G. B. Setzler, of Norton, was elected president for the ensuing year, succeeding Dr. W. B. Barham, of Big Stone Gap. Vice-presidents are Dr. J. G. Bentley, Blackwood, Dr. W. B. Peters, Appalachia, and Dr. E. P. Cox, of Norton. Dr. C. B. Bowyer, Stonega, was re-elected secretary.

Sunbaths for Babies.

The gospel of plenty of sunshine for everybody, especially for children and most especially for babies, is being preached widely, and the Federal Children's Bureau has built a model which shows at a glance how sunbaths can be given to babies for the prevention and cure of rickets. This model will be loaned for use at child-welfare conference exhibits on application to the U. S. Children's Bureau, Washington, D. C.

Washington Meeting of the A. M. A.

Time is rapidly approaching for the Washington meeting of the American Medical Association. Meeting so near home, we should have a large representation from Virginia. The dates are May 16-20. The Registration Bureau, Scientific Exhibit, Moving Picture Theater, and Technical Exhibits will all be housed in the Washington Auditorium. The various sections will meet at places which will be announced on the program.

Dr. R. A. Vonderlehr,

Formerly of Richmond but now with the U. S. Public Health Service, announces that his address is now care the United States Quarantine Station, Rosebank, Staten Island, New York.

Dr. J. McCaw Tompkins,

Richmond, has been elected a member of the Board of Governors of Westmoreland Club, this city, for the ensuing year.

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Mental Hygiene Service for Children in New York.

An entire floor of the main building of the New York State Psychiatric Institute and Hospital will be devoted to the observation and treatment of children who are retarded mentally or show mental disturbance. There will be schoolrooms, workshops and playrooms for children of both school and preschool age. The institution is to be built on Riverside Drive, New York City, and will specialize in the prevention and treatment of mental diseases and in psychiatric research and teaching.

Dr. and Mrs. J. H. Crouch,

Who have been working with the James City County Health Unit, with headquarters at Williamsburg, Va., have gone to Fort Worth Texas, where Dr. Crouch will continue in health work.

"Why Is He Not Even Accorded a Hearing?"

This is the question asked in an editorial in the *Richmond News Leader* with regard to the charges made by Dr. W. Armistead Gills against the medical administration of the United States Navy. The editorial states that every man who has charges to bring should be accorded a hearing when he is criticizing a sysstem, not for personal gain but for the benefit of a large number who are not in position to offer protest. "Why is he not accorded a hearing?" Why should not those in power wish to get the other man's point of view?

Dr. Lawrence T. Royster,

Professor of pediatrics at the University of Virginia, read a paper on "Malnutrition in Children" before the Norfolk County Medical Society, February the 28th.

Dr. William G. Smith,

Of the class of '25, Medical College of Virginia, has completed his internship at Uniontown Hospital, Uniontown, Pa., and has located at Wendell, N. C.

Georgia is Fighting to Prevent Diphtheria.

The Medical Association of Georgia cooperated with the United States Public Health Service in giving diphtheria toxin-antitoxin to more than 25,000 school children within the last two months of 1926. In at least one militia district in the State every child under 10 years of age was immunized.

Dr. Robert P. Cooke

Recently resigned his connection with the Accomac County, Va., health unit, and has gone to Lexington, Va., to be in charge of the health unit just organized to include Lexington and Rockbridge County.

Dr. Fred J. Wampler, for the past fourteen years a medical missionary in China, has taken charge of the health unit in Accomac County.

Georgians Further Honor Crawford W. Long.

We note in the *Fulton County Medical Bulletin* that a prize to be known as the Crawford W. Long Memorial Prize for Research Work is to be given yearly for the best piece of original work of merit accomplished by any member in good standing of the Medical Associatian of Georgia. This is given by a donor interested in stimulating scientific research work in medicine in Georgia, aad may be in any branch of medicine. Competition for this prize comes up for the first time at the next annual meeting of that State association in May, 1927.

Dr. C. S. Lawrence,

Of Winston-Salem, N. C., was elected president of the North Carolina State Health Association at its 1927 meeting.

Dr. A. W. Lewis,

Of Aylett, Va., was in Richmond, early in February as a delegate to the Conference on Higher Education.

Dr. Walter C. Klotz,

Formerly at Blue Ridge Sanatorium, this State, and later connected with the National Military Hospital, at Johnson City, Tenn., resigned the latter part of 1926 and returned to New York City, where he is connected with the Clinic of the Cornell University Medical College.

Honor Veteran Physician.

Sixty-one members of the Norfolk County Medical Society gathered at Monticello Hotel, in that city, February 24th, for a dinner to honor Dr. R. S. Perkins, on the occasion of his fifty-fifth anniversary in the practice of medicine. Dr. Perkins, who was graduated from a homeopathic school in 1872 was, on this occasion, made an honorary member of the Norfolk County Medical Society. Following an acknowledgment of this honor by Dr. Perkins and some remarks as to the many changes which had taken place in Norfolk since he located there, talks were made by Drs. Israel Brown, W. L. Harris, Frank Hancock, Eugene Lowenberg, S. A. Sutton, E. E. Feild, and W. L. Driver. Dr. J. Warren White, president of the Society, presided.

Dr. and Mrs. G. B. Barrow,

Of Clarksville, Va., have returned home after a short visit to Richmond.

The South Carolina State Medical Association

Is to hold its annual meeting at Anderson, April 19, 20 and 21, under the presidency of Dr. George H. Bunch, of Columbia. Dr. E. A. Hines, Seneca, is secretary.

Dr. C. E. Foley,

Formerly of this State but more recently of Raleigh, N. C., has located in Washington, D. C., with offices in the Medical Science Building. He is limiting his practice to diseases of the eye, ear, nose and throat.

The Southwestern Virginia Medical Society,

Which will meet in Pulaski, Va., March 24 and 25, under the presidency of Dr. Z. V. Sherrill, of Marion, gives promise of being interesting and pleasant as are all of these meetings. There will be papers by several invited guests, a symposium and a number of voluntary papers. Dr. E. G. Gill, of Roanoke, is secretary-treasurer.

Dr. T. E. Armstrong,

Recently physician to the Tubize Company in Hopewell, Va., has gone to New York, where he is taking post-graduate work in diseases of the eye, ear, nose and throat with a view to entering private practice.

Dr. and Mrs. William Branch Porter,

Recently of Roanoke, Va., sailed early this month for Europe. Mrs. Porter will travel on the continent, while Dr. Porter is engaged in scientific work. They will return next summer and make their home in Richmond, where Dr. Porter will be connected with the Medical College of Virginia.

Superintendent of Southwestern State Hospital.

Dr. George A. Wright, of Abingdon, Va., has been elected superintendent of the Southwestern State Hospital at Marion, Va., to fill the unexpired term of Dr. E. H. Henderson, who died the latter part of February. Dr. Wright was formerly first assistant physician at this hospital, but for the past few years has been connected with the staff of the George Ben Johnston Memorial Hospital at Abingdon, Va.

Dr. Horace G. Longaker,

Newport News, Va., recently resigned as assistant city health officer of that place.

The Richmond Ophthalmological and Otolaryngological Society,

At its annual meeting on February the 15th, elected the following officers for the ensuing year: President, Dr. R. H. Wright; vice-president, Dr. T. E. Hughes; secretary-treasurer, Dr. Francis H. Lee (re-elected).

Dr. E. A. Holmes,

Formerly of Broadford, Va., is now located in Marion, Va., where he has been engaged in general practice for the past year.

Dr. John M. Love,

Of the U. S. Public Health Service, who has recently been stationed at New Haven, Conn., has been transferred to U. S. Veterans' Bureau Hospital, at Outwood, Ky.

Wanted.

An experienced woman assistant in laboratory, urological, X-ray, electric therapeutics, and secretarial work, desires position in a doctor's office. Richmond location preferred. References furnshed. Address No. 40, care this journal. (Adv.)

Obituary

Dr. Frederick M. Hisey,

Of Edinburg, Va., died December 22, 1926, after an illness of more than a year, aged seventy-one years. Dr. Hisey graduated in medicine from the College of Physicians and Surgeons of Baltimore in 1881, and for forty-five years practiced his profession in Edinburg where he had many friends and was greatly beloved. His wife, who was Miss Mollie Wightman, died about two years ago. Dr. Hisey had been a member of the Medical Society of Virginia since 1889 and was a Mason and an Odd Fellow, both of which orders held their burial rites at the grave. He is survived by three brothers and a large family connection.

Dr. E. H. Henderson,

Superintendent of the Southwestern State Hospital at Marion, Va., died at his home in that place, February 25th, death being due to heart trouble. Dr. Henderson was born in Giles County, Va., fifty-five years ago and studied medicine at the former University College of Medicine, Richmond, from which he graduated in 1898. He became a member of the Medical Society of Virginia the following year. Dr. Henderson had been connected

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with the hospital at Marion for the past seventeen years and had been its superintendent since 1914. His wife, three brothers and a sister survive him.

Dr. Thomas Clinton Firebaugh,

Prominent physician of Harrisonburg, Va., died at the hospital in that place on January the 12th, after a short illness with pneumonia. Dr. Firebaugh was born at Mt. Clinton, Va., fifty-eight years ago and studied medicine at the University of Virginia, receiving his diploma in 1894. He had been a member of the Medical Society of Virginia since 1899. Dr. Firebaugh was prominently identified with the professional and civic life of Harrisonburg and had a large circle of friends. He had been specializing for some years in X-ray work and had practiced continuously in Harrisonburg except for the time he saw service in the World War. He was never married but is survived by two brothers, a sister and an adopted brother.

Resolutions on Death of Dr. William P. McGuire.

The Medical Staff of the Winchester Memorial Hospital, Winchester, Va., at its meeting on February 4, 1927, adopted the following resolutions on the death of Dr. McGuire:

On the evening of November 15, 1926, the life of Dr. William P. McGuire came to a close. The opportunities for usefulness in such a long life have been given to but few, and that these opportunities were taken full advantage of is well known even by those who had only a remote acquaintance with him.

Dr. McGuire was born in Winchester on July 19, 1846. When a lad of sixteen, he enlisted as a private in the Confederate Army, and served until captured, remaining a prisoner until the end of the war.

Following in the footsteps of his illustrious father, Dr. Hugh Holmes McGuire, he entered the profession of medicine and graduated from the Medical College of Virginia in 1867. Returning to Winchester, he entered actively into professional life here and continued practice over a period of sixty years. Probably no one person played a more important part in the organization, construction and operation of the Winchester Memorial Hospital than Dr. McGuire. Not only through his personal work, but it was largely through his influence, that funds were obtained from people of wealth of New York and elsewhere for the establishment of this institution. His efforts were always in the direction of a larger and better hospital and he was ever jealous lest its standards would not be of the highest. Even in the latter years of his life, although no longer actively engaged in hospital work, his interest never failed.

Dr. McGuire was more than a good physician; he was also a most excellent business man, having been the president for years of one of our most successful banks, and having in the past administered severally very large estates. That he was of importance to his community is attested by the fact that he was a member of the Handley Board of Trustees, President of Mt. Hebron Cemetery Company, a member of the Board of Trustees of the Shenandoah Valley Academy, and a member of a commission to care for George Washington's Headquarters.

In addition to all of these, he had time for his Church, having been a very active and interested member of Christ Episcopal Church, on the vestry of which he served for more than forty years.

Because of these facts, and because of the fine life of devotion to his community and to his family, the Staff of the Winchester Memorial Hospital, deeply sensible of the great loss sustained by the death of Dr. McGuire, and fully realizing that the written word is entirely inadequate to express our sorrow for his death, or our appreciation of his useful life, yet desiring to place upon our record a tribute to his memory, do therefore resolve,

THAT in the death of Dr. William P. McGuire, we have lost a most valuable member, whose professional life was an inspiration to those of us who were so fortunate as to have been associated with him, and whose worth to this staff and the hospital will be appreciated more and more with the passing of years.

THAT we extend to his family our heartfelt sympathy and pray that they will be comforted by the knowledge of his Christian life, and the promise of our Saviour to his faithful servants when He said, "We shall meet again where there shall be no more parting and no more sorrow."

THAT a copy of these resolutions be spread upon the minutes of this organization, that a copy be sent to members of the family, and that a copy be published in the *Winchester Evening Star* and in the VIRGINIA MEDICAL MONTHLY.

J. E. HARRIS, *Secretary,*
Winchester Memorial Hospital.

Dr. Sumpter George,

Of Pelham, N. C., died in Danville, Va., February 21st, of heart disease. He was sixty-four years of age and was graduated in medicine from the University of the City of New York in 1886. He practiced for a number of years in Danville, before moving to Pelham, and was formerly a member of the Medical Society of Virginia.

Dr. Moulton K. Johnson,

Medical Inspector Commander, U. S. Navy, retired, died at his home in Cincinnati, Ohio, in January, as the result of a fall on an icy sidewalk. He was fifty-seven years of age and graduated in medicine from the University of Virginia, in 1895.

Malcolm Hart Harris.

Friends of Dr. and Mrs. George T. Harris, of Madison Heights, Va., will learn with regret of the death of their young son, Malcolm, nine years of age, early in February. Death was due to a hemorrhage of the brain caused by a blow from a baseball while playing.